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Pesticide Residues

Results from the period 2004-2011

DTU Fødevareinstituttet

Pesticide Residues

Results from the period 2004 – 2011

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Pesticide Residues
Results from the period 2004-2011

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1 Preface

The present report presents the results from the 2004-2011 period of the monitoring programmes conducted by The Danish Veterinary and Food Administration. The programmes included commodities of fruit, vegetable, cereals and animal origin using random sampling from food on the Danish market. Since the beginning of the 1960, Denmark has monitored fruit and vegetables for pesticides residues.

For the periods 1993-1997 and 1998-2003, results were collated and the dietary exposure was calculated. In this report data for the analyses carried out in the period 2004-2011 are reported as well as the exposure calculations performed on the background of the residues found. All the analyses have been carried out by the laboratory of the Danish Veterinary and Food Administration in Ringsted. The samples were collected by the food control offices.

The residue data have been combined with consumption data and the exposures for different consumer groups have been estimated.

2 Sammenfatning og konklusion

I denne rapport præsenteres resultaterne for kontrol for pesticidrester i fødevarer i Danmark i perioden 2004-2011. Antal stoffer varierer fra år til år, da der løbende blev inkluderet nye stoffer i analyseprogrammet. Der blev analyseret for omkring 249 pesticider, der dækker ca. 275 individuelle stoffer inklusiv metabolitter. Der blev i alt analyseret 17309 prøver af frugt, grønt, cerealier, kød, børnemad og andre forarbejdede fødevarer. Fordelingen mellem de forskellige typer af fødevarer kan ses i tabel 1.

Resultaterne viser, at der var langt flere fund af pesticider i frugt og grønt (se tabel 3) end i andre afgrøder. Sammenlignes frugt, grønt og cerealier indeholdt frugt langt flere pesticidrester (se figur 1-3). Der var generelt flere pesticidrester i udenlandske produkter i forhold til danske (se figur 1-3), og der blev hyppigere fundet flere pesticider i samme prøve i udenlandske prøver sammenlignet med prøver fra Danmark. Der blev generelt fundet overskridelser af MRL i ca. 2,6 % af prøverne. I prøver som appelsin, mandarin og banan blev der fundet pesticidrester i stort set alle prøver. Det skal dog understreges, at prøverne blev analyseret med skræl. For langt de fleste pesticider viser undersøgelser af fordelingen i den spiselige og ikke-spiselig del (f.eks. skræl), at størstedelen af de fundne indhold findes i den ikke-spiselige del.

Der er foretaget en sammenligning af den del af afgrøderne, der bidrager mest til indtaget af pesticider. Der er foretaget en sammenligning af prøver mellem de lande, hvorfra der har været udtaget mere end 10 prøver til kontrol i perioden 2004-2011. For afgrøder, der bliver dyrket både i Danmark og i udlandet, viser resultaterne generelt, at der var en mindre hyppighed af pesticidrester i danske afgrøder sammenlignet med udenlandske afgrøder. For enkelte afgrøder var hyppigheden af fund i danske prøver imidlertid ikke det laveste blandt alle lande. Det drejede sig om jordbær, blommer, gulerødder, agurk, spinat, hvedemel og hvedekerner.

Resultaterne fra analyseprogrammet er brugt til at beregne eksponeringen fra fødevarer ved at gange et gennemsnitsindhold med et gennemsnitskonsum. Der kan bruges forskellige modeller til at beregne en eksponering. Man kan inkludere, at restindhold kan forøges eller formindskes ved forarbejdning. Man kan også tage i betragtning, at prøver med indhold under rapporteringsgrænsen (LOR) kan have et indhold på 0 mg/kg eller et meget lavt indhold. Derfor er der regnet med og uden forarbejdning, samt at indholdet er 0, ½LOR og ½LOR med korrektion for indhold under LOR. I sidstnævnte beregning indgår en korrektion med en begrænsning på maksimalt en faktor 25. Dette er nærmere beskrevet i Annex 6.2.

Eksponeringen varierede mellem 44 og 144 µg/person/dag for børn og 68 og 222 µg/person/dag for voksne alt efter hvilken model, der blev anvendt. I de videre beregninger er der valgt en model, hvor der er taget hensyn til forarbejdning og brug af ½LOR med en korrektion. Det gav en eksponering på henholdsvis 98 µg/person/dag for børn og 146 µg/person/dag for voksne.

Risikovurderingen for et enkelt pesticid blev udført ved beregning af en såkaldt Hazard Quotient (HQ). HQ er forholdet mellem eksponeringen og det Acceptable Daglige Indtag (ADI) for pesticidet. HQ for de enkelte pesticider ligger mellem 0,00001 % og 2,35 % (de fleste under 1 %), hvilket indikerer, at der ikke er en sundhedsmæssig risiko ved indtag af de enkelte pesticider. Der er også udført en risikovurdering af det kumulative indtag af de fundne pesticider ved at summere alle HQ for de enkelte pesticider til et såkaldt Hazard Indeks (HI). HI varierer mellem 4 % og 49 % for voksne og 10 % til 124 % for børn alt efter hvilken model, der er brugt i beregningerne. Med den valgte model er HI beregnet til 18 % for voksne og

44 % for børn. Da HI metoden forudsætter samme type effekt for alle de fundne pesticider, er metoden relativt konservativ (dvs. 'på den forsigtige side'), da alle pesticider ikke har samme type af effekter. HI på 18 % for voksne og 44 % for børn indikerer således, at der ikke er en sundhedsmæssig risiko ved indtag af de fundne pesticider samtidigt.

Som tidligere nævnt blev der generelt fundet færre pesticidrester i danske afgrøder sammenlignet med afgrøder fra udlandet. Dette har også indflydelse på eksponeringen. Spiste man danske afgrøder, når det var muligt, nedsatte man både eksponering og HI. For børn faldt eksponeringen fra 98 µg/person/dag til 52 µg/person/dag, mens HI faldt fra 44 % til 20 %. For voksne er de tilsvarende tal, at eksponeringen faldt fra 146 µg/person/dag til 76 µg/person/dag, og at HI faldt fra 18 % til 8 %.

Myndighederne anbefaler voksne at spise mindst 600 g frugt og grøntsager om dagen. For mænd og kvinder er indtaget beregnet for dem, som spiser mere end 550 g frugt og grønt om dagen. Dette fik eksponeringen og HI til at stige med en faktor 1,5-2. HI var dog stadig mindre end 100 %.

Det er også beregnet hvilke pesticider og afgrøder, der bidrog mest til eksponeringen. For pesticiderne var dette fordelt mellem mange stoffer. Fordelingen var også vidt forskellig, om man så på eksponering eller HQ. For afgrøder derimod var det et mindre antal afgrøder, der bidrog både til eksponering og HI. Æbler var i begge tilfælde langt den største bidragsyder. I alt bidrog 25 forskellige afgrøder til ca. 95 % af eksponeringen og HI.

Resultaterne for perioden 2004-2011 viser lige som resultaterne for sidste periode (1998-2003), at det beregnede Hazard Index var under 100 % for både børn og voksne. Dette gælder også for voksne, der spiser mere end 550 g frugt og grønt om dagen.

Der ses en mindre stigning i den beregnede eksponering for voksne, og et fald i Hazard Index. På grund af usikkerhederne og de forskellige forudsætninger for beregningerne i de to perioder, er det ikke muligt at afklare, hvorvidt tallene er udtryk for reelle ændringer.

For børn er der beregnet for forskellige aldersgrupper i de to perioder, og derfor kan tallene ikke sammenlignes.

3 Summary and conclusion

In this report the results for the analyses of pesticide residues in foods on the Danish market are presented. The analytical programme included about 249 pesticides covering about 275 substances including metabolites. The number of substances varied from year to year due to the fact that more and more substances are included in the programme. In total 17309 samples have been analysed. The samples included fruit, vegetables, cereals, meat, baby food and other processed food. The distribution between the different kinds of commodities is shown in Table 1.

The results show that more residues were found in samples of foreign origin compared to samples of Danish origin (see Figure 1-3). Overall fruits and vegetables had higher frequencies of residues than the other groups of commodities; fruits had higher frequencies compared to vegetables. Also, samples with more than one residue were more frequently found in samples of foreign origin. Overall residues above the MRLs were found in 2.6 % of the samples, most frequently in fruit.

For some of the commodities that contributed most to the exposure the frequency of residues in samples have been compared between countries when the number of samples were higher than 10. The frequency of residues in commodities grown both in Denmark and abroad were, in general, higher in samples of foreign origin than in Danish samples. Also, samples with residues above the MRLs were more often in samples of foreign origin. However, for strawberries, plums, carrots, cucumbers, spinach, wheat flour and wheat the frequencies in Danish samples were higher compared to some of the other countries.

The results from the analytical programme have been used to calculate the exposure for the Danish population by multiplying a mean of the residues with a mean of the consumption. There is no common agreement in EU or internationally on how to calculate the exposure; e.g. if a processing factor shall be included or not or residues below the reporting limit (LOR) also called non-detects shall be included as zero or with a value, e.g. ½LOR. To investigate the influence from these factors the exposure for adults (15-75 years) and children (4-6 years) were calculated with several models. This includes using a reduction factor for peeling for some fruits as well as using ½LOR and ½LOR with correction for non-detects. The correction is used to restrict the difference of using ½LOR instead of 0 to a factor of 25.

The exposure estimated using the different models varied between 44 and 144 µg/person/day for children and between 68 and 222 µg/person/day for adults. It was decided that the most appropriate would be to continue with a model taking peeling into consideration as well as eventual residues below LOR. Therefore, ½LOR with correction for non-detects was used in the model together with peeling. The different models are further described in Annex 6.2. With this model, the exposure was estimated to be 98 µg/person/day and 146 µg/person/day for children and adults, respectively.

The risk assessment for a single pesticide is performed by estimation of the so-called Hazard Quotient (HQ). The HQ is calculated by dividing the exposure with the Acceptable Daily Intake (ADI) for the individual pesticide. The HQs for the individual pesticides ranged from 0.00001% to 2.35% with most of the HQs being below 1% indicating no risk of adverse effects following exposure to the individual pesticides. Risk assessment of the cumulative exposure to the detected pesticides has been performed by summing up the HQs for the individual pesticides to provide a so-called Hazard Index (HI). HI varied between 4% and 49% for adults and 10% and 124% for children. With the chosen model, the HI is 18% for adults and 44% for children. As the HI method assumes the same kind of adverse effect for all the detected pesticides it is a relatively conservative (i.e. precautionary) approach for cumulative risk assessment. Overall, the HI of 18% for adults and 44% for children is not considered to indicate a risk of adverse effects following a cumulative exposure to all the detected pesticides.

As mentioned above, commodities of Danish origin, generally, contained fewer pesticides compared to commodities of foreign origin. This can also have an influence on the exposure. If commodities of Danish origin were chosen whenever possible, the exposure and HI decreased. For children, the exposure decreased from 98 µg/person/day to 52 µg/person/day while HI decreased from 44% to 20%. For adults the exposure decreased from 146 µg/person/day to 76 µg/person/day while the HI decreased from 18% to 8%.

For men and women the exposure has been estimated for those who consumed more than 550 g of fruit and vegetables every day. The exposure calculations showed that their exposure was 1.5-2 times higher than that for the average consumer. However, the HI was below 100% in both cases.

It has also been estimated which commodities and pesticides that contributed most to the exposure and HI. For the pesticides the contributions were distributed between several pesticides and there was a big difference in the pesticides that contributed most to the exposure and HI. However, only a limited number of commodities contributed most both to the exposure and HI. Apples were, under all circumstances, the greatest contributor. About 95% of the exposure and HI were accounted for by 25 different commodities.

The results from the period 2004-2001 show, as for the previous period (1998-2003) that the calculated Hazard Index was below 100% for both adults and children. This was also the case for adults consuming more than 550 g of fruit and vegetables per day.

For adults a minor increase in the calculated exposure and a decrease in Hazard Index were observed. However, due to the uncertainties and the different basis for the calculations in the two periods a clear conclusion on the changes cannot be drawn.

For children the calculations have been performed for two different age groups in the two periods, and therefore it is not possible to compare the results.

4 Pesticide residues and exposure

4.1 Monitoring programme

Over the years, the number of pesticides analysed has increased and was 249 in 2011. The number of substances including isomers and metabolites was approximately 275. The total number of samples in the period 2004-2011 has been relatively stable. However, the fruit, vegetable and cereal samples have increased and the number of samples of animal origin has decreased slightly (see **Figure 1**). The results have been published each year in the period 2004-2011 (Pesticidrester i fødevarer, 2004; Christensen et al., 2005; Christensen et al., 2006; Christensen et al., 2007; Petersen et al., 2008; Jensen et al., 2009; Jensen et al., 2010; Jensen et al., 2011).

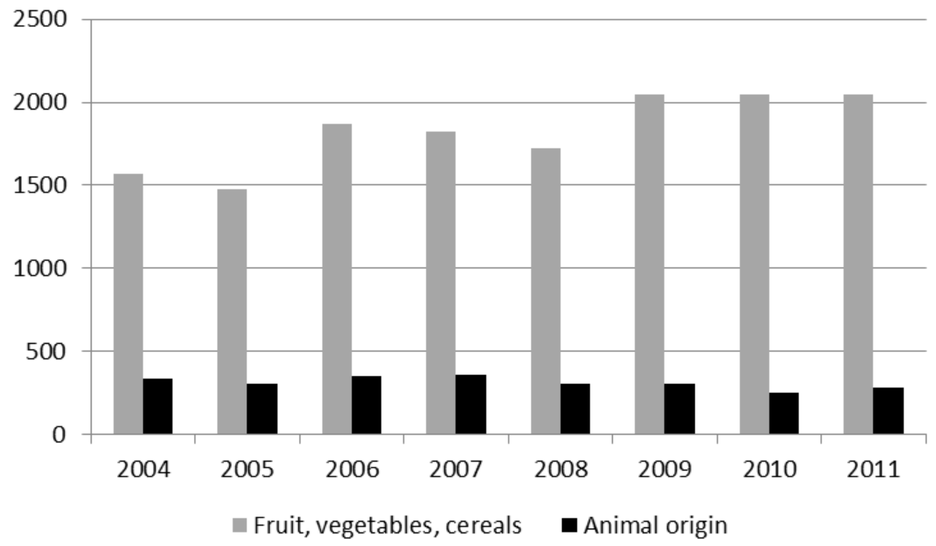

Figure 1. *Numbers af fruit, vegetable and cereal samples and samples of animal origin analysed from 2004-2011*

Design of sampling plan

The Danish pesticide monitoring programme has two objectives. Firstly, the programme had to check compliance with the maximum residue levels laid down by the EU (EU Commission, 2005), and secondly to monitor the residue levels in foods to enable an evaluation of the exposure of the Danish population to pesticides.

The sampling plan for the period 2004 to 2006 was structured in the same manner as the period 1998-2003. A detailed description can be seen in Poulsen et al. (2005). The design of the sampling plan was changed in 2006 and has been kept the same way since then. The sampling plan for fruit and vegetables was designed in two parts. Part one included samples that can be used to estimate the exposure of pesticides and to see possible trends in pesticide residues between years. For 25 different fruit, vegetable and cereal commodities, a fixed number of 50 samples per year were collected. The commodities were chosen, based on their contribution to the intake of pesticides for the Danish population calculated on the monitoring results from the period 1998-2003 (Poulsen et al., 2005). This included also processed commodities like wine. Likewise, 15 samples were collected of commodities included in the EU Multiannual Pesticide Control Programme (EU Commission, 2012). Part two included samples that contributed in minor degree to the intake of pesticides, but where the control was focussed on the compliance with MRLs or labelling of production method, e.g. organic grown, produced without growth regulator or surface treatment. Part one consisted of 70% of the fruit and vegetable and 15% of the cereal samples.

Sampling

Authorised personnel from regional food control units under the Danish Veterinary and Food Administration performed the sampling and collected the samples randomly within each commodity. The sampling procedure conformed to the EU directive on sampling for official control of pesticide residues (European Union, 2002). A total of 17309 samples were taken primarily at wholesalers, importers, slaughterhouses and at food processing companies (see **Table 1**). Most of the samples were conventionally grown fresh fruits and vegetables (70%), but also conventionally grown cereals (10%) and samples of animal origin (11%) were collected. In addition 6% samples of organically grown crops (fresh, frozen, processed) were collected as well as processed foods (e.g. wine) and samples of baby food. One third of the fruit and vegetable samples and two thirds of the cereals samples were of Danish origin. For meat more than 90% of the samples were of Danish origin. Almost 175 different fruits, vegetables and cereal commodities were sampled, of these 73 were also organically produced.

Sampling of meat and other products of animal origin are regulated by EU Directive 96/23/EC. The aim of this directive is to ensure that the Member States monitor primarily their own production of commodities of animal origin for different substances e.g. pesticides. However, imported samples from third countries shall also be monitored. Depending on the animal species the number of samples was between 0.03% and 0.15% of the production or import.

For fruits, vegetables, and cereals the aim has been to monitor the commodities sold on the Danish market. Consequently, more samples produced in EU Member States and third countries have been collected compared to samples of Danish origin.

Table 1. *Number of samples analysed for the period 2004-2011, Danish and foreign origin, respectively.*

Foods	Danish	Foreign	Total
Fruit and vegetables (fresh, frozen, processed)	2844	9182	12026
Cereals (including processed)	717	1060	1777
Wine	2	273	275
Meat	1589	358	1947
Milk and honey	146	0	146
Baby food	28	38	66
Organically grown fruit, vegetables and cereals (fresh, frozen, processed)	358	714	1072
Total	5684	11625	17309

Laboratories

Samples were primarily analysed at the Regional Food Laboratories. However, a few of the samples were analysed at DTU National Food Institute. All laboratories involved in the monitoring were accredited for pesticide analysis in accordance to ISO 17045 by the Danish body of accreditation, DANAK.

Analytical Programme

Analytical methods were developed and documented at the DTU National Food Institute.

Fruits and vegetables were analysed by up to five different analytical methods covering 149-238 pesticides (see **Table 2**) and including isomers and metabolites the number of substances were approximately 275. Cereals were analysed by three different methods and meat by one method. The number of analytical methods used for other commodities differs depending on the matrices.

Table 2. *Number of pesticides, analysed for in the period 2004-2011 in different types of foods. Isomers and metabolites are not included*

Foods/Year	2004	2005	2006	2007	2008	2009	2010	2011
Fruit and vegetables	149	158	164	176	176	222	238	230
Cereals	105	114	112	112	170	165	165	166
Meat	30	28	28	28	28	28	28	44
Baby/infant food	153	0	166	178	207	215	240	238

The pesticide profile is shown in Appendix 7.2

4.2 Residues

In **Table 3** the average frequencies of samples with residues are shown. However, the figures have a large variation covering commodities with very low frequencies and others where, practically all samples contained residues. Among the fruit and vegetables commodities, nuts and some of the herbs had the lowest frequencies of sample with residues. Other commodities with low frequencies were Danish produced courgette, broccoli and leek, all with 5% samples with residues. Likewise, foreign produced Chinese cabbage, cauliflowers/broccoli and sweat corn contain 0%, 2% and 5% samples, respectively, with residues. On the other end of the scale, were especially the foreign produced commodities from the citrus group, peas with pods, and banana/papaya with high frequencies of positive samples, namely 98%, 95% and 85%, respectively. No Danish produced fruit and vegetables had that high frequency of samples with residues.

Although the commodities in the group of processed fruit and vegetable are more limited there is also some variation in the frequencies from mixed juice with 0% to orange marmalade with 52% samples with residues.

The cereals covers less commodities and the cultivation is, likely, more comparable resulting in less variation in the frequencies.

However, in general the exposure of pesticides differs from commodity to commodity. This is described in Section 4.3.The frequencies listed above in **Table 3** have to be considered as the lowest possible frequency, since the pesticide profile in the analytical methods did not cover all pesticides used in Denmark or in the countries exporting to Denmark. Furthermore, it is supposed that there will be residues below the detection limits.

Table 3. *Frequency of samples with residues*

Foodstuff	Frequency of samples with residues[1]	Frequency of samples above MRL
Fruit and vegetables (fresh, frozen)	53%	3.8%
Cereals (including processed)	27%	0.1%
Meat	0%	0.0%
Baby food	0%	0.0%
Milk and honey	0%	0.0%
Processed fruit and vegetables	42%	0.2%
Processed cereals	12%	0.0%
Organically grown fruit, vegetables and cereals	2%	0.4%
Total	40%	2.6%

1. Includes also samples above MRL

Comparison between Danish and foreign produced commodities

Figure 2 shows the frequencies of samples without detections, with detections below, the MRL at the MRL or above the MRL for fruit commodities produced in Denmark, the EU, and outside the EU.

In general, samples of fruit commodities produced in Denmark had lower frequencies of detections below MRL (38-67%) than fruit commodities produced outside Denmark (61-82%). However, the fruit commodities were not the same as many fruits, which cannot be grown in Denmark (e.g. oranges, pineapples). It seems as though the frequencies of samples without detection have increased throughout the years. No differences were seen between samples produced in the EU and outside the EU, except for samples with detection above MRL, where samples produced outside the EU, more frequently, had residues above MRL, namely, 4-7% and 0-3% respectively.

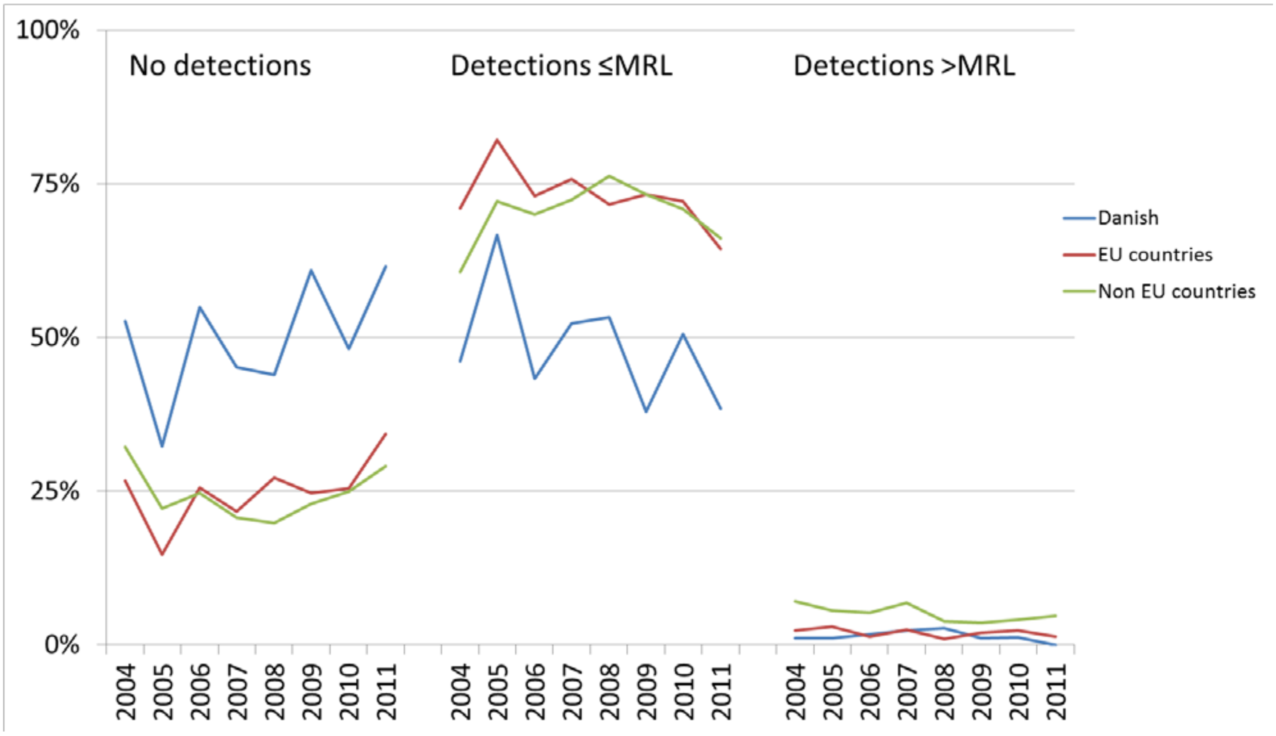

Figure 2. *Pesticide residues detected in fruit produced in Denmark, the EU and outside the EU*

Figure 3 shows frequencies of samples without detections, with detection below MRL and above MRLs for vegetable commodities produced in Denmark, the EU and outside the EU. In general, there were fewer samples of vegetable with residues compared to fruit. Furthermore, vegetables produced in Denmark had lower frequencies of detections below MRL (7-12%) than vegetables produced outside Denmark (22-42%). The type of vegetables produced in Denmark and outside was in general the same, except for commodities like sweet peppers and beans with pods. No differences were seen between samples produced in the EU and the outside EU, except for samples with detection above MRL, where samples produced outside the EU more frequently had residues over the MRL namely respectively 5-14% and 0-6%.

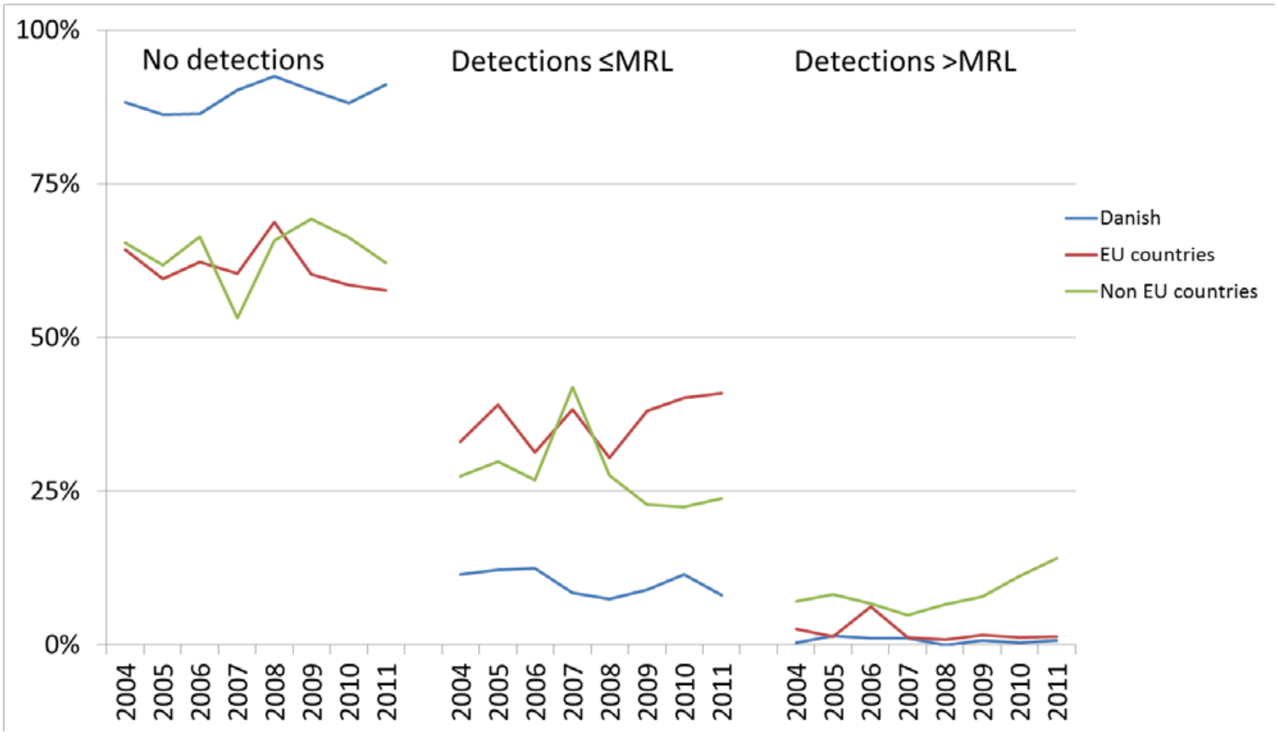

Figure 3. Pesticide residues detected in vegetables produced in Denmark, the EU, and outside the EU

Figure 4 shows frequencies of samples without detections, with detection below MRL and above MRLs for cereal commodities produced in Denmark, the EU, and outside the EU. In general, fewer samples of cereal commodities have residues compared to fruit and vegetables. Cereals produced in Denmark had lower frequencies of detections below MRL (8-26%) than cereals produced in the EU (39-67%), while cereals grown outside EU had residues frequencies at the same level as Denmark (9-30%). The type of cereals produced in Denmark and the EU was different from cereals produced outside the EU. The cereal samples produced outside the EU were mainly rice and the samples from the EU and consisted mainly of wheat, oat, rye and barley. Residues above MRLs are rarely found in cereals. For the period 2004-2011 only one Danish sample from 2010 exceeded the MRL (chlormequat in oat).

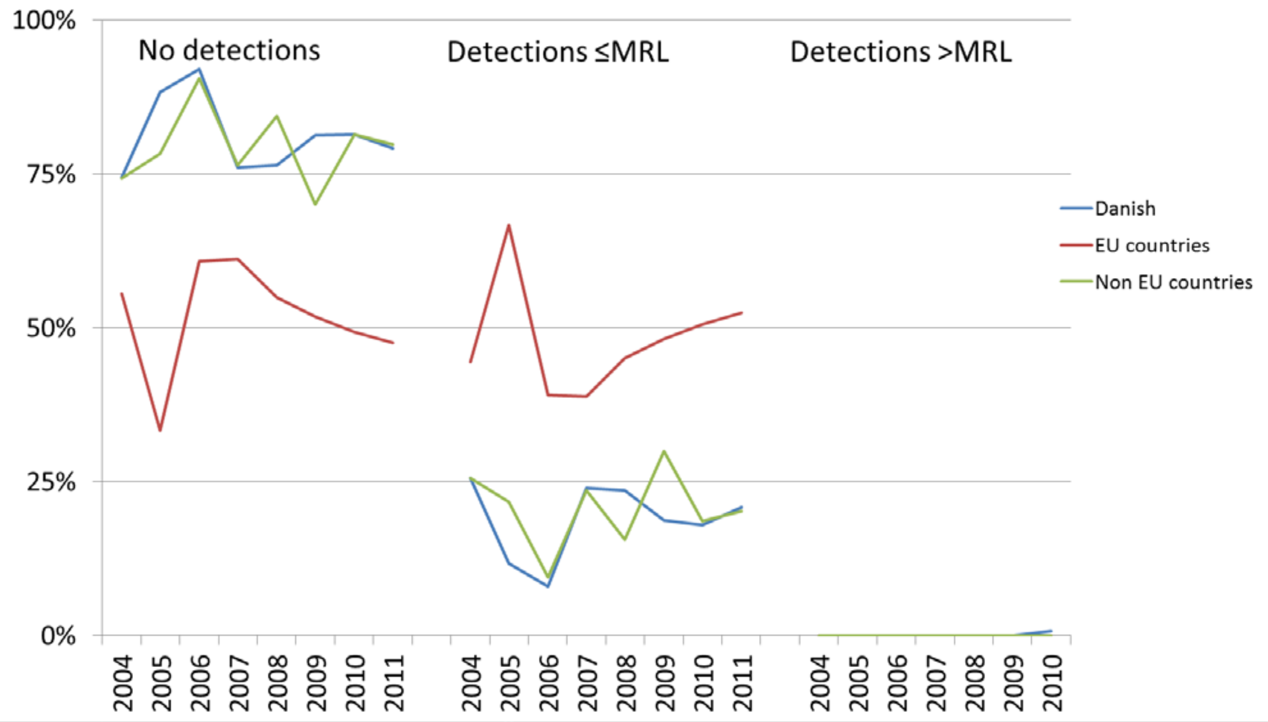

Figure 4. Pesticide residues detected in cereals produced in Denmark, the EU and outside the EU

Detailed evaluation of pesticide residue in commodities produced in different countries.

Although pesticide residues seldom exceed the maximum residue limits, consumer awareness on health issues, due to food contaminants, is high. Many consumers are anxious about the pesticides residues in their food and want to avoid them, as much as possible. The commodities consumed in Denmark are produced in many different countries and the monitoring data have been evaluated to see if there were differences in the frequencies of samples with residues produced in Denmark and outside Denmark, or between countries. For twelve fruit, eight vegetable and three cereal commodities, differences were observed in frequencies of detected pesticide residues. The results from these commodities are evaluated more closely, later in this paragraph.

Only commodities, where more than 10 samples from the same country were analysed, are included in this evaluation. Therefore, figures are only given for countries from where more than 10 samples were collected.

For bananas, grape fruit, lemon and oranges, no differences were seen as pesticides were detected in almost all samples

Bananas

Most samples taken originated from Columbia, Costa Rica, Ecuador (> 90%). In total, 425 banana samples were collected and analysed in the period 2004-2011. Most of them, 388, were exported from these four countries. The rest were imported to Denmark from 11 different countries (Bermuda, Brazil, Chile, Dominican Republic, Guatemala, Honduras, Israel, Mexico, Panama, Thailand, and the USA). In total, 85% of the samples contained 14 different pesticide residues; no residues were above the MRLs. Most of the frequencies were 80-70 and 50% of the samples contained more than one residue.

Mandarins and clementine

Most samples taken originated from Spain. In total, 411 samples of mandarins and clementine were collected and analysed in the period 2004-2011. Most of them, 322 (78%), were produced in Spain. The rest of the samples were produced in 12 different countries (Australia, Cyprus, Italy, Pakistan, Peru, the USA, Chile, Israel, Turkey, Morocco, South Africa and Uruguay). In total, 99% of the samples contained pesticide residues, 4% above the MRLs and 55 different pesticides were found. Almost all the samples had residues and 93% of the samples contained more than one residue.

Grapefruit

The main exporters to the Danish market were South Africa, Turkey, the USA and Israel. In total, 388 grapefruit samples were collected and analysed in the period 2004-2011. Most of them, 274, were produced in these four countries. The remaining samples were produced in 16 different countries (Argentina, Chile, Costa Rica, Cuba, Cyprus, Egypt, Greece, Honduras, Jamaica, Mexico, Morocco, Netherlands, Switzerland, Spain, Swaziland, and Zimbabwe). In total, 99% of the samples contained pesticide residues, 5% above the MRLs and 46 different pesticide residues were found. More than one residue was found in 86% of the samples.

Lemons

Most samples taken originated from Spain. In total, 381 lemon samples were collected and analysed in the period 2004-2011. Most of them, 243 (64%), were produced in Spain. The rest of the samples were produced in 8 other countries (Argentina, Israel, Italy, Morocco, South Africa, Turkey, the USA and Uruguay). In total, 97% of the samples contained pesticide residues, 1% above the MRLs and 39 different residues were found. Almost all the samples had residues and it was also found that 79% of the samples contained more than one residue.

Oranges

Most samples taken originated from Spain, Greece, South Africa and Morocco. In total, 491 orange samples were collected and analysed in the period 2004-2011. Most of them, 400, were produced in these four countries. The rest were produced in 12 other countries (Argentina, Australia, Brazil, Chile, Egypt, Israel, Italy, Portugal, Swaziland, Turkey, Uruguay and Zimbabwe. In total, 98% of the samples contained pesticide residues and 49 different pesticide residues were found. In 82% of the samples more than one residue was detected.

Apples

Apples are grown in Denmark and approximately 40% of total the number of samples in the period 2004-2011 was covered by Danish apples. Approximately, one third of the samples were produced in France and Italy and the rest were produced in 13 other countries (Argentina, Belgium, Brazil, Chile, China, Germany, Italy, New Zealand, Poland, Spain, South Africa, Uruguay and the USA). In total, 585 apple samples were collected and analysed

The Danish produced apples had residues of 12 different pesticides in 46% of the samples and 2% contained residues above the MRLs. The foreign produced apples had residues of 54 different pesticides in 80% of the samples and 3% contained residues above the MRLs. A major difference was seen between Danish apples and apples of foreign origin in respect to the number of pesticides found and the frequency of samples with residues. **Figure 5** shows the differences between apples samples. Most of the frequencies in foreign produced apples were between 58-100% and 39% of the foreign produced samples contained more than one residue, while only 9% of the Danish produced samples had multiple residues.

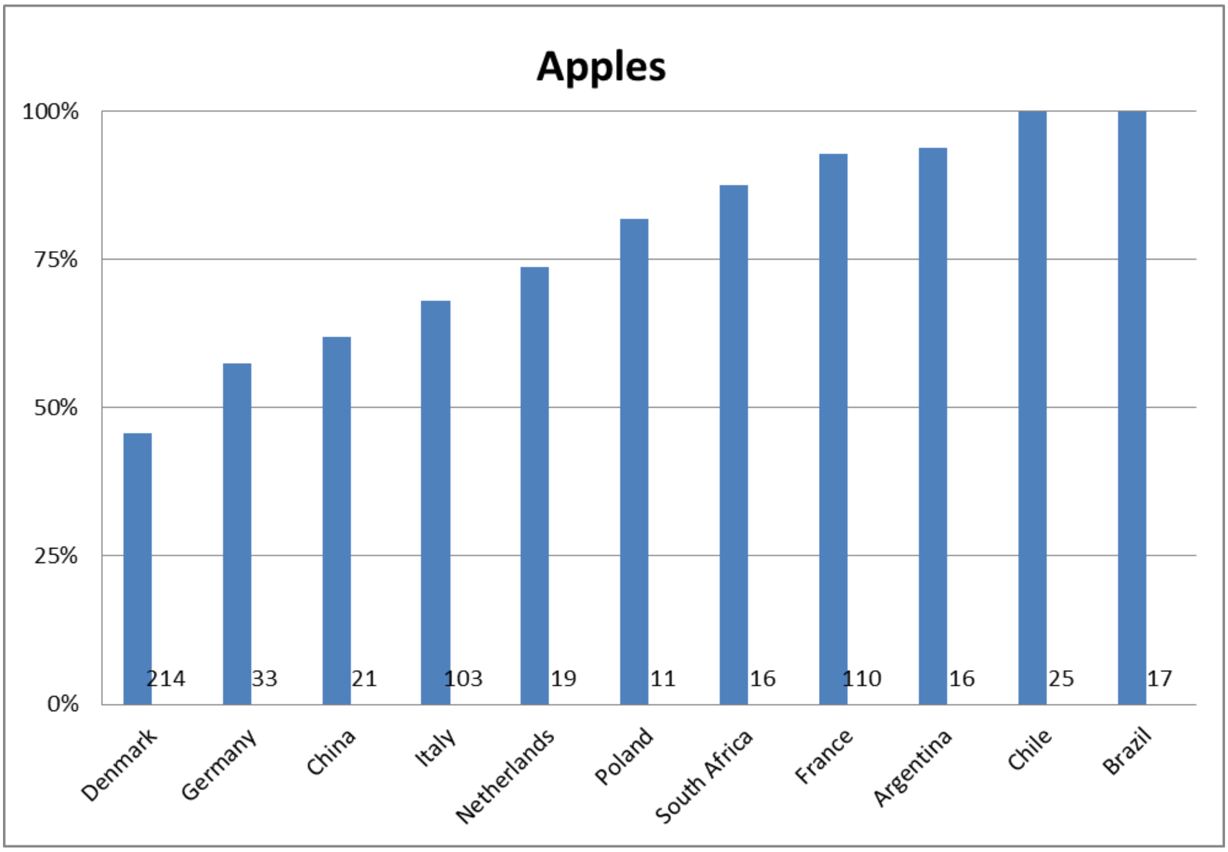

Figure 5. *Frequencies of samples with residues for apples produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Table grapes

Most samples taken originated from South Africa, Italy, Chile, India and Spain. In total, 460 grape samples were collected and analysed in the period 2004-2011 and 354 (77%), were produced in the five mentioned countries. The rest were produced in 12 other countries (Argentina, Australia, Brazil, Egypt, Greece, Israel, Namibia, Netherlands, Peru, Saudi-Arabia, Turkey, and the USA). In total, 79% of the samples contained pesticide residues, 1% above MLRs and 54 different pesticide residues were found.

Table grapes from Brazil, Egypt, South Africa and Argentina contained residues in 50-75% of the samples while samples from the other countries with more than 10 samples showed higher frequencies. **Figure 6** shows the differences between table grapes samples. Most of the frequencies were 60-90%, and in 49% of the samples more than one residue was detected.

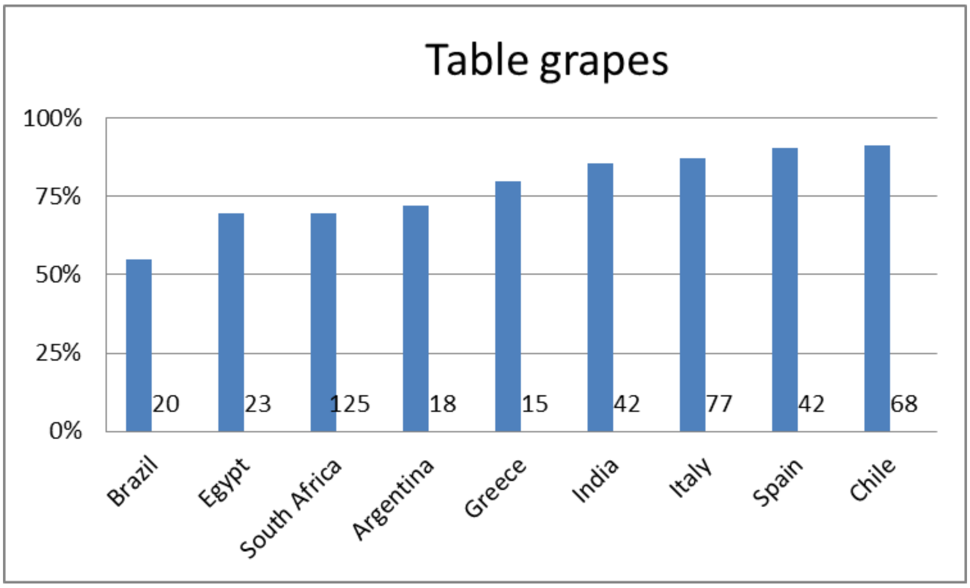

Figure 6. *Frequencies of samples with residues for table grapes produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Melons

Most samples taken originated from Spain, Brazil and Costa Rica. In total, 312 melon samples were collected and analysed in the period 2004-2011 and 279 (89%) of the samples were produced in these three countries. The rest originated from 11 other countries (Croatia, Ecuador, France, Israel, Mauritania, Morocco, Netherlands, Panama, Thailand, Turkey, and the USA). In total, 54% of the foreign samples contained pesticide residues, 3% above MRLs and 38 different pesticide residues were found. **Figure 7** shows the differences between the five countries where more than 10 samples have been collected. Most of the frequencies were 40-94%, and 1% of the samples contained more than one residue.

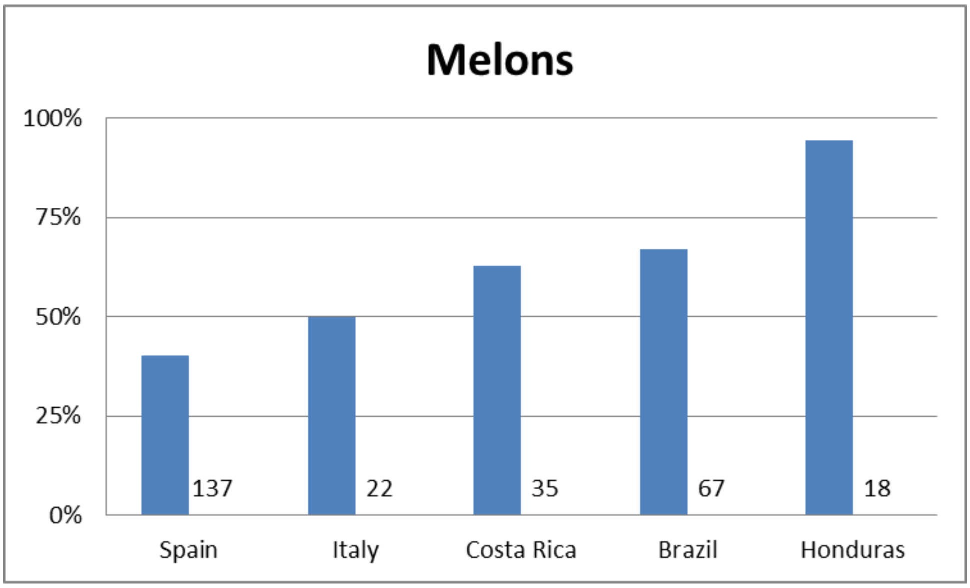

Figure 7. *Frequencies of samples with residues for melons produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Strawberries

Strawberries are grown in Denmark and approximately 40% of the samples were of Danish origin in the period 2004-2011. The main part of the samples was produced in Spain, Poland, Germany, and Belgium (45% of the samples). The rest of the samples (15%) were produced in 10 other countries (China, Egypt, Hong Kong, Israel, Italy, Morocco, Netherlands, Portugal, South Africa, and the USA). In total, 429 strawberry samples were collected and analysed.

The Danish produced strawberries contained residues of 11 different pesticides in 60% of the samples and none with residues above the MRLs. The foreign produced strawberries had residues of 45 different pesticides in 70% of the samples and 5% above the MRLs. Samples from China, Poland and Egypt had lower frequencies of samples with residues than the Danish produced samples (see **Figure 8**), while samples from other countries contained higher frequencies. Most of the frequencies were 50-85%, and 39% of the foreign produces samples contained more than one residue while 18% of the Danish produced samples had multiple residues.

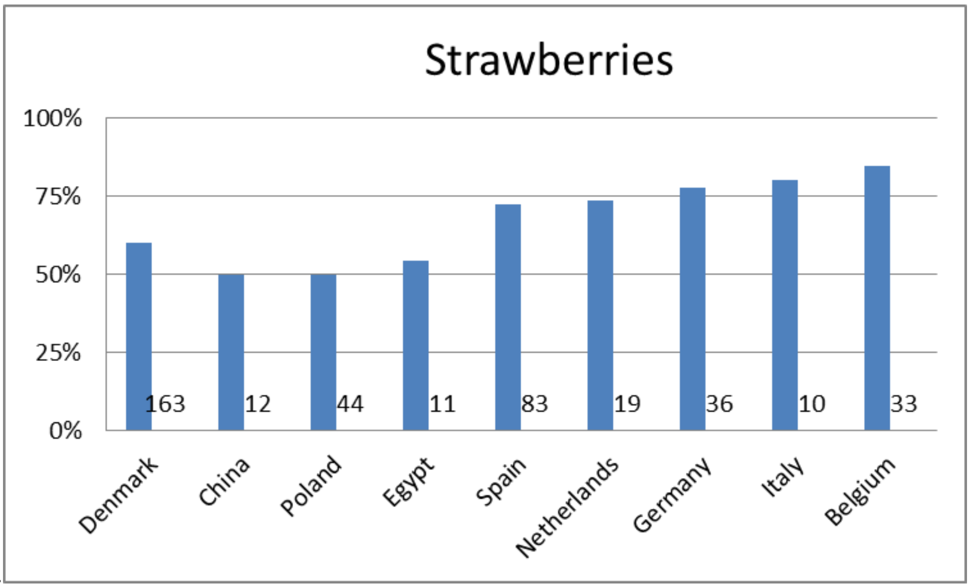

Figure 8. *Frequencies of samples with residues for strawberries produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Peaches and nectarines

Most samples taken, namely 342, originated from Spain, Italy and Chile. The rest, were produced in seven other countries (Argentina, Egypt, France, Greece, Morocco, Netherlands and South Africa). In total, 69% of the samples contained pesticide residues, 1% above the MRLs, and 50 different pesticide residues were found. **Figure 9** shows the differences between the countries. Most of the frequencies were 32-92%, and 38% of the samples contained more than one residue.

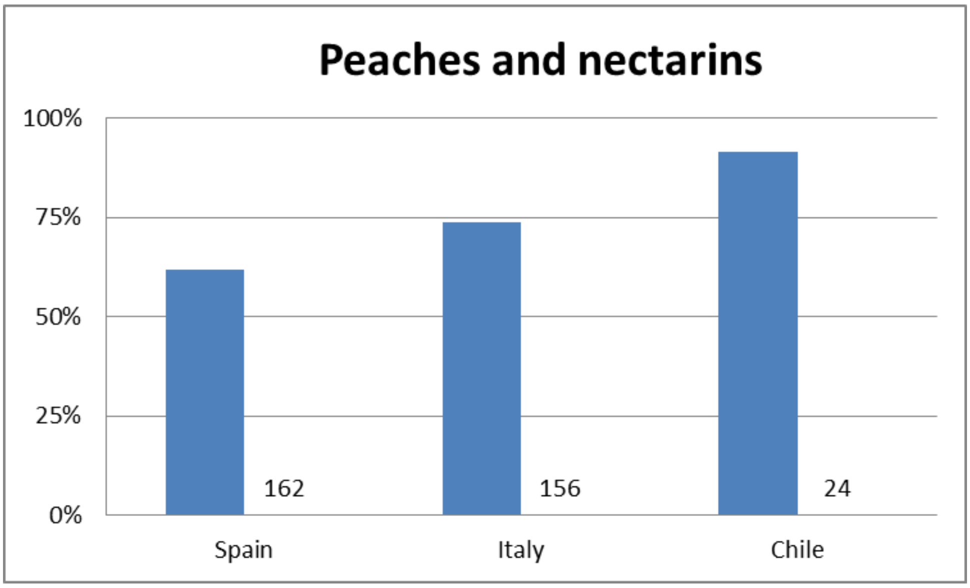

Figure 9. *Frequencies of samples with residues for peaches and nectarines produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Pears

Pears are grown in Denmark, and approximately 30% of the collected samples in the period 2004-2011 were covered by Danish pears. Most samples originated from the Netherlands covering about one third of the samples taken. The rest of the samples originated from 10 other countries (Argentina, Belgium, Chile, China, France, Germany, Italy, Poland, Spain and South Africa). In total, 466 pear samples were collected and analysed.

The Danish produced pears had residues of six different pesticides in 55% of the samples and 1% above the MRLs. The samples of foreign origin had residues of 48 different pesticides in 88% of the samples (see **Figure 10**). Most of the frequencies were between 55-100% and 59% of the foreign produced samples contained more than one residue while 15% of the Danish produced samples had multiple residues.

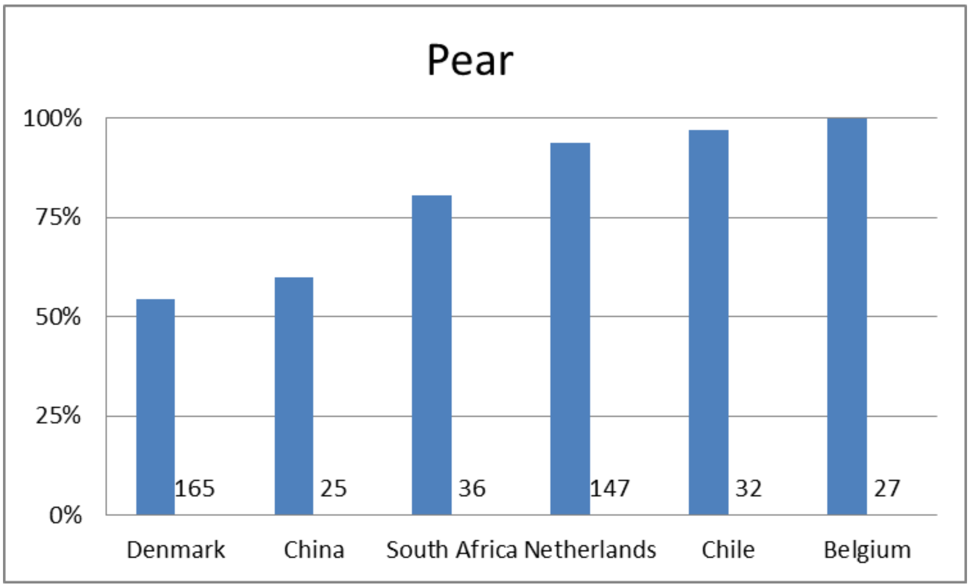

Figure 10. *Frequencies of samples with residues for pear produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Plums

Plums are grown in Denmark, and approximately 20% of the collected samples the period 2004-2011 were covered by Danish plums. Most of the samples originated from Spain, South Africa and Chile covering about one third of the market. The remaining samples were produced in 7 other countries (Argentina, Belgium, France, Italy, Portugal, Serbia-Montenegro, and Turkey). In total, 391 pear samples were collected and analysed.

The Danish produced plums had residues of 11 different pesticides in 33% of the samples and 4% above the MRLs. Samples of foreign origin contained residues of 31 different pesticides in 47% of the samples (see **Figure 11**). Samples from Argentina and France had lower frequencies of samples with residues than the Danish produced plums, while samples from other countries contained higher frequencies. Most of the frequencies were between 15-85% and 11% of the foreign produces samples contained more than one residue while 8% of the Danish produced samples had multiple residues.

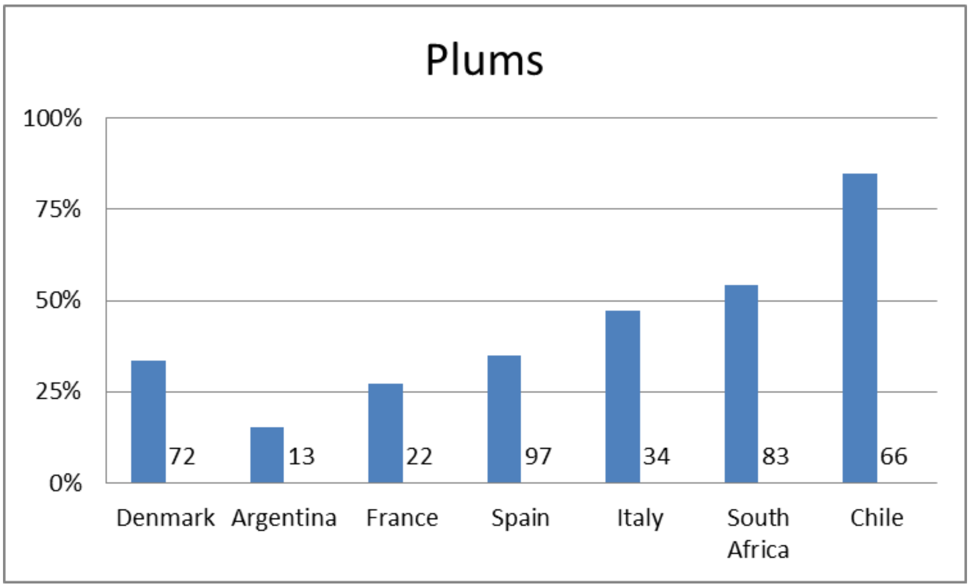

Figure 11. *Frequencies of samples with residues for plums produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Beans with pods

Only six samples produced in Denmark were analysed and no pesticide residues were found. Most of the samples originated from Kenya, Germany, Egypt, Netherlands and Morocco. In total, 311 bean samples were collected and analysed in the period 2004-2011 and 240 of them (79%), were produced in the five afore mentioned countries. The rest were originated from 16 other countries (Belgium, Ethiopia, France, Grenada, India, Israel, Italy, Malaysia, Senegal, South Africa, Spain, Sweden, Thailand, Turkey, Vietnam, and Zambia). In total, 51% of the samples of foreign origin contained pesticide residues, 10% above MRLs and 43 different pesticide residues were found.

Differences were observed between the countries and can be seen in **Figure 12**. Most of the frequencies were 50-75%, and 18% of the samples contained more than one residue.

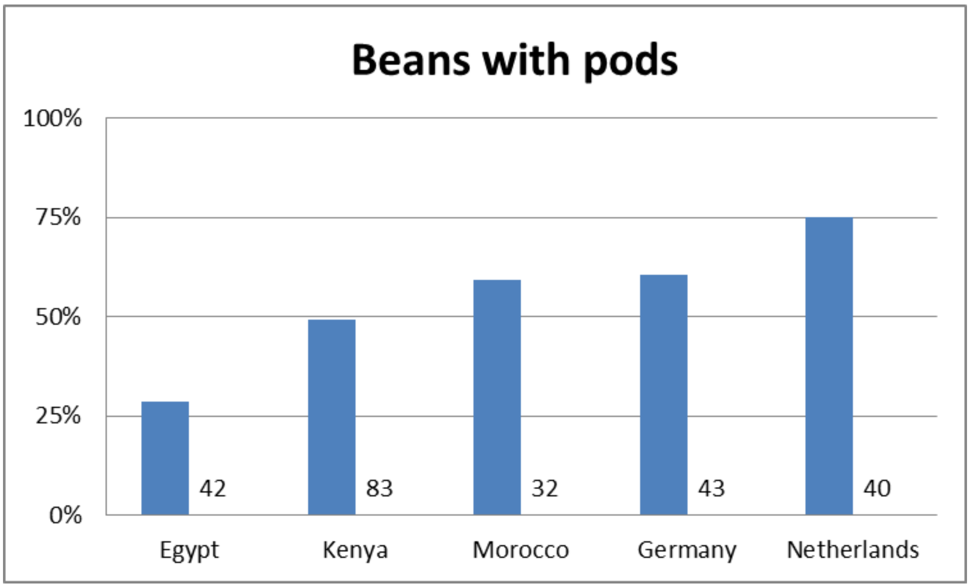

Figure 12. *Frequencies of samples with residues for beans with pods produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Carrots

Carrots are grown in Denmark, and approximately 70% of the collected samples in the period 2004-2011 were covered by Danish carrots. Most of the samples originated from Italy and Germany covering 20% of the market. The rest were produced in 7 other countries (Belgium, France, Netherlands, Poland, Portugal, Spain and Sweden). In total, 499 carrot samples were collected and analysed.

The Danish produced carrots had residues of 9 different pesticides in 16% of the samples (see **Figure 13**). Four of the pesticides were pollutants from earlier use and these residues were all above the MRLs. The samples of foreign origin had residues of 19 different pesticides in 33% of the samples. The exception was carrots from Belgium. Most of the frequencies were 16-43%, and 10% of the foreign produces samples contained more than one residue while only 1% of the Danish produced samples had multiple residues.

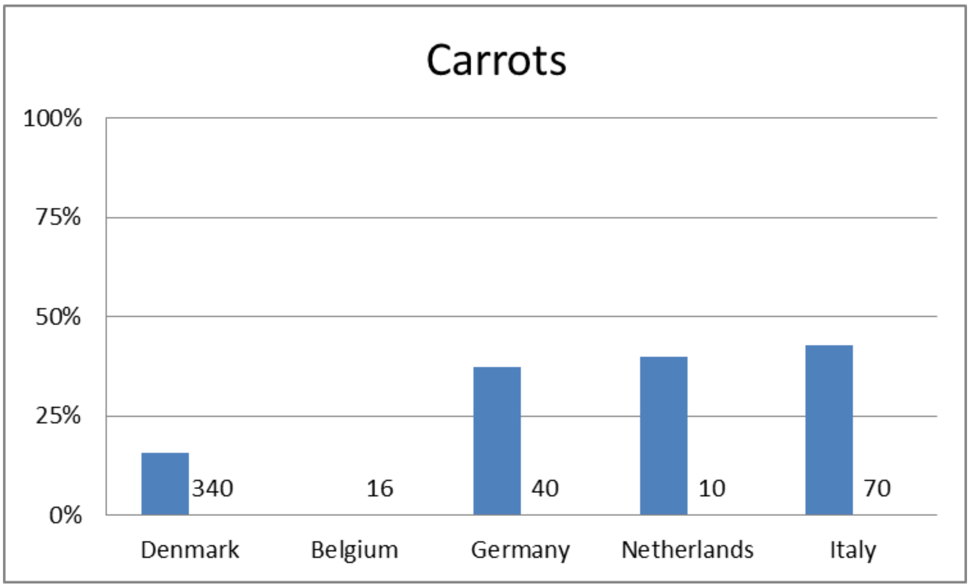

Figure 13*. Frequencies of samples with residues for carrots produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Cucumbers

Cucumbers are grown in Denmark, and approximately 50% of the collected samples in the period 2004-2011 were covered by Danish cucumbers. Most of the samples originated from the Netherlands and Spain (50%). In total, 417 cucumbers samples were collected and analysed. Of these, 14 samples came from Egypt, Jordan, Macedonia, Poland, Sweden and Turkey.

The Danish produced cucumbers had residues of 6 different pesticides in 38% of the samples; none above the MRLs (see **Figure 14**). The samples of foreign origin had residues of 36 different pesticides in 58% of the samples, 3% above the MRLs. However, there is a major difference for the Netherlands and Spain. The frequency of positive samples was about the same in Denmark and the Netherlands while the frequency in samples from Spain is considerably higher; about 37% compared to 85% (see **Figure 14**). Most of the frequencies were 37-85%, and 6% of the foreign produced samples contained more than one residue while 7% of the Danish produced samples had multiple residues.

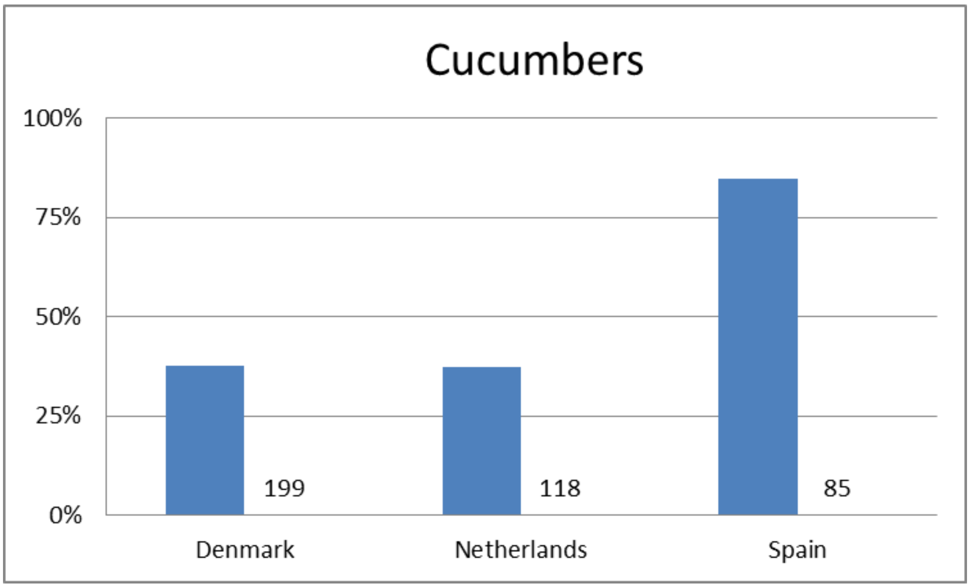

Figure 14. *Frequencies of samples with residues for cucumbers produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Lettuce

Lettuce is grown in Denmark and approximately 50% of the collected samples in the period 2004-2011 were covered by Danish lettuce. One third of the samples originated from Spain and Germany while the rest were produced in 9 other countries (Albania, Belgium, France, Israel, Italy, Netherlands, Poland, Portugal, and Sweden). In total, 371 lettuce samples were collected and analysed.

The Danish produced lettuce had residues of 8 different pesticides in 13% of the samples (see **Figure 15**), 1% above the MRLs. The samples of foreign origin had residues of 36 different pesticides in 45% of the samples, 4% above the MRLs. A major difference was seen between the different countries but Danish produced lettuce has under all circumstances a much lower frequency of samples with residues compared to foreign samples. Most of the frequencies were 13-65%, and 25% of the foreign produces samples contained more than one residue while 2% of the Danish produced samples had multiple residues.

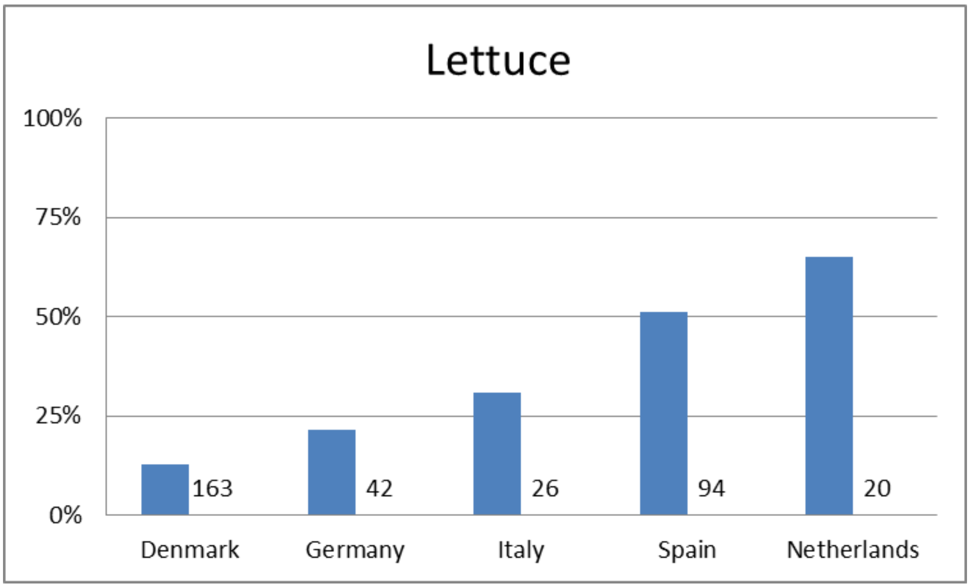

Figure 15. *Frequencies of samples with residues for lettuce produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Sweet peppers

Only 2 samples produced in Denmark were analysed and no pesticide residues were found. Most of the samples originated from the Netherlands and Spain. In total, 387 sweet pepper samples were collected and analysed in the period 2004-2011 and 278 (72%) of them were produced in the two afore mentioned countries. The rest, originated from 11 other countries (Belgium, Colombia, Egypt, Germany, Greece, Hungary, Israel, Morocco, Poland, South Africa, and Turkey). In total, 38% of the samples of foreign origin contained pesticide residues, 2% above MRLs and 52 different pesticide residues were found.

Figure 16 shows the differences between the countries. Most of the frequencies were 11-80% and 17% of the samples contained more than one residue.

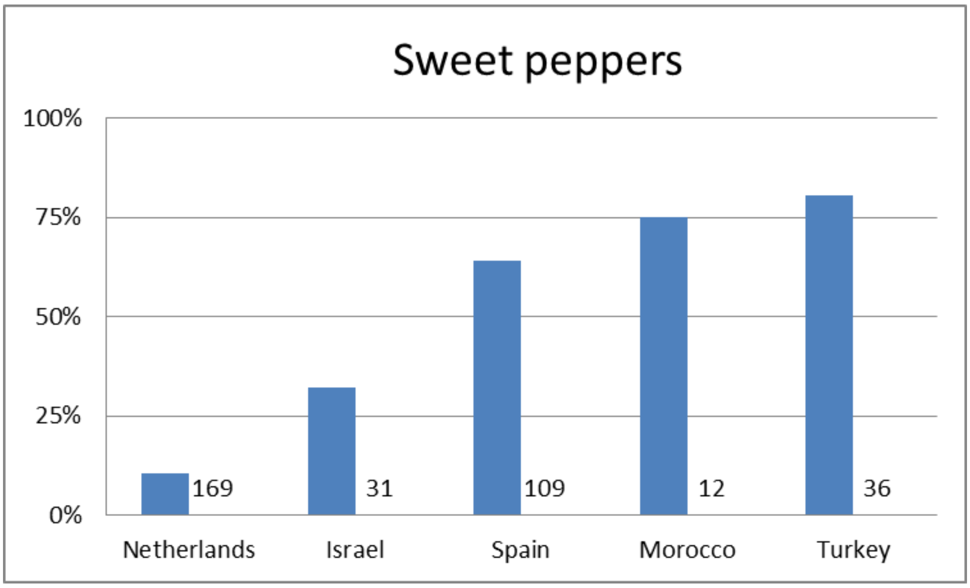

Figure 16. *Frequencies of samples with residues for sweet peppers produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Potatoes

Potatoes are grown in Denmark, and approximately 85% of the collected samples in the period 2004-2011 were covered by Danish potatoes. Most of the samples originated from the United Kingdom and France. In total, 669 potato samples were collected and analysed. Almost 75% were produced in Denmark, 10% in the UK and France and 15% in 8 other countries (Cyprus, Egypt, Germany, Israel, Italy, Morocco, Spain, and the USA).

The Danish produced potatoes had residues of 4 different pesticides in only 2% of the samples (see **Figure 17**), none above the MRLs. One of the pesticides was pollutant from earlier uses. The foreign produced samples had residues of 7 different pesticides in 25% of the samples, none above the MRLs. One of the pesticides was pollutant from earlier use. Differences were seen between Danish and potatoes of foreign origin with respect to both the number of pesticides found and the frequency of samples with residues. Most of the frequencies were 2-54%, and 3% of the foreign produces samples contained more than one residue while none of the Danish produced samples had multiple residues.

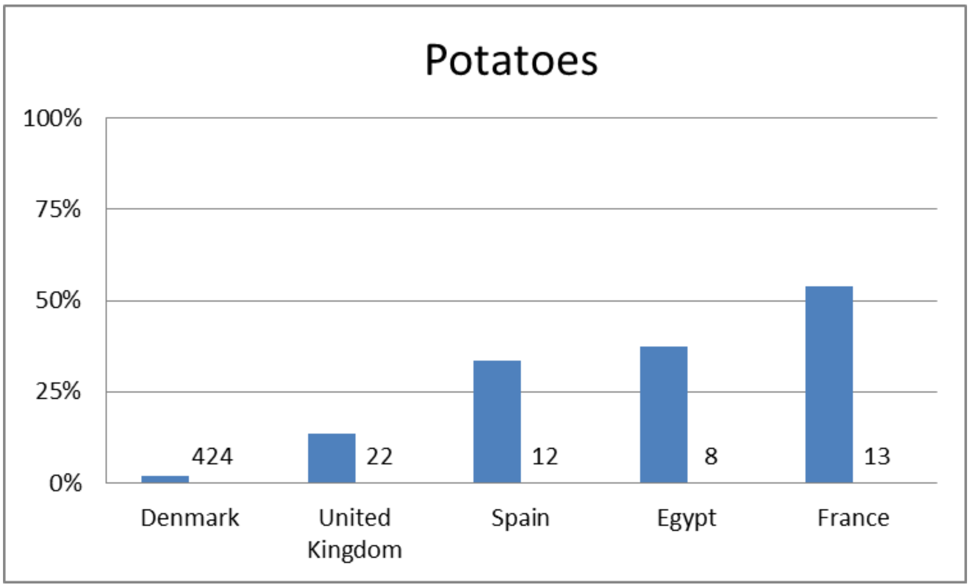

Figure 17. *Frequencies of samples with residues for potatoes produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Spinach

Spinach is grown in Denmark, and approximately 33% of the collected samples in the period 2004-2011 were covered by Danish spinach. Most of the samples originated from Italy and Germany (50%). The rest of the samples were produced in 7 other countries (Belgium, France, Netherlands, Poland, Spain, Sweden, and Thailand). In total, 244 spinach samples were collected and analysed.

The Danish produced spinach had residues of 9 different pesticides in 20% of the samples (see **Figure 18**). 7% was above the MRLs. One of the pesticides was a pollutant from earlier use. The foreign produced samples had residues of 25 different pesticides in 34% of the samples, 7% above the MRLs. One of the pesticides was a pollutant from earlier use. Danish and Belgian spinach samples had frequencies below 25%, while the other foreign produced spinach had up to 69%. Most of the frequencies were 17-69%, and 1% of the foreign produces samples contained more than one residue while 1% of the Danish produced samples had multiple residues.

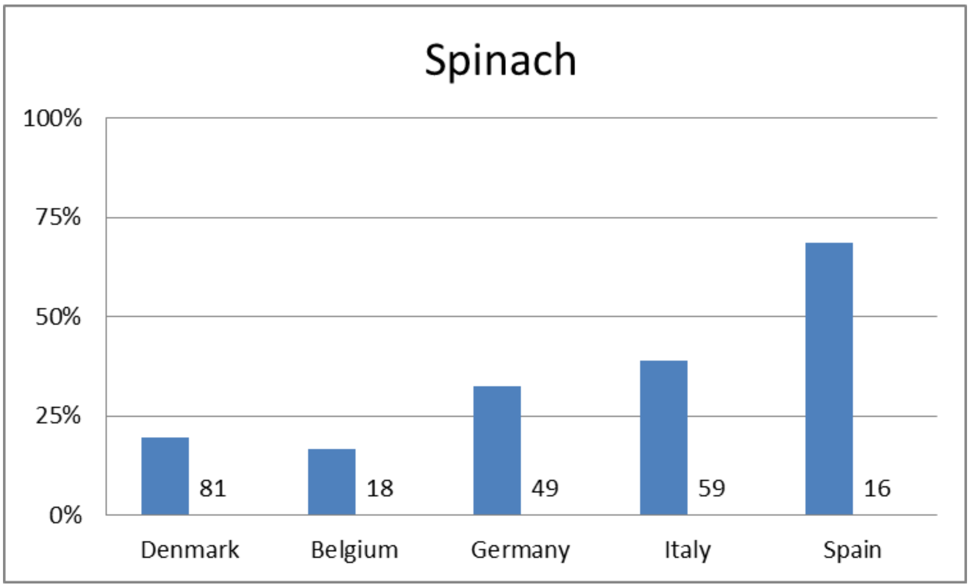

Figure 18. *Frequencies of samples with residues for spinach produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Tomatoes

Tomatoes are grown in Denmark, and approximately 45% of the collected samples in the period 2004-2011 were of Danish origin. Most of the samples originated from Spain and Netherlands (45%). The remaining samples were produced in 10 other countries (Belgium, Egypt, France, Israel, Italy, Morocco, Poland, Senegal, Thailand and Turkey). In total, 462 tomato samples were collected and analysed.

The Danish produced tomatoes had residues of six different pesticides in only 5% of the samples (see **Figure 19**) with none above the MRLs. The foreign produced had residues of 48 different pesticides in 59% of the samples, 1% above the MRLs. A major difference was seen between Danish and tomatoes of foreign origin with respect to the number of pesticides found and the frequency of samples with residues. However, also frequencies for the foreign samples varied greatly (see **Figure 19**). The foreign produced tomatoes had frequencies in the range of 33-82%, and 35% of the foreign produces samples contained more than one residue while only 1% of the Danish produced samples had multiple residues.

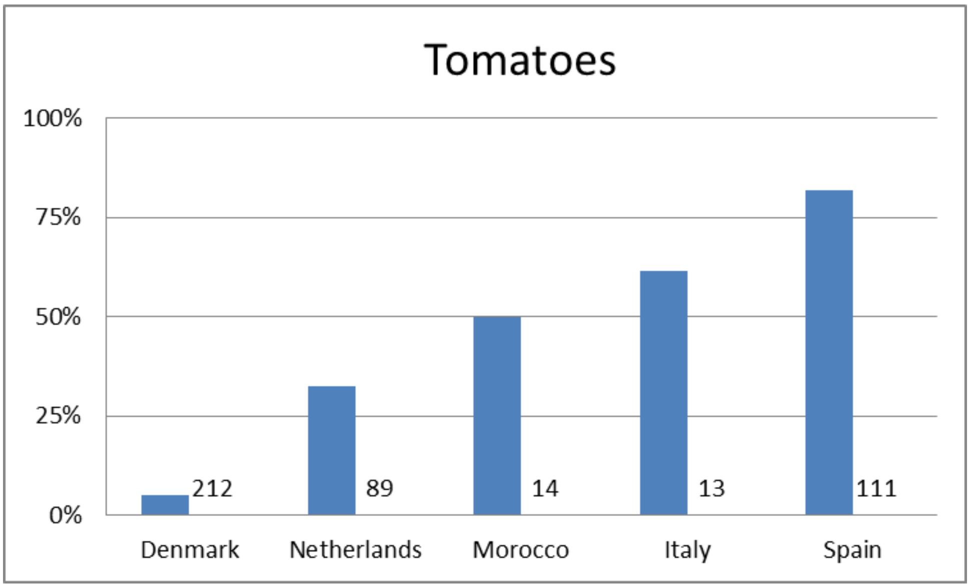

Figure 19. *Frequencies of samples with residues for tomatoes produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Rolled oat

Oat is grown in Denmark, and approximately 40% of the samples of rolled oat were of Danish origin. The origin of 30% of the analysed samples was unknown, but samples from Germany, Poland, Sweden, and the United Kingdom were collected and analysed.

The Danish produced rolled oat had residues of 2 different pesticides in 4% (see **Figure 20**) of the samples, none above the MRLs. The unknown origin and the foreign produced samples had residues of 6 different pesticides in 39% of the samples; none above the MRLs. Samples originating from Denmark or Sweden and samples of unknown origin had frequencies below 18%, while rolled oat samples from UK and Germany had frequencies between 80-84%, and 5% of the foreign produces samples contained more than one residue while none of the Danish produced samples had multiple residues.

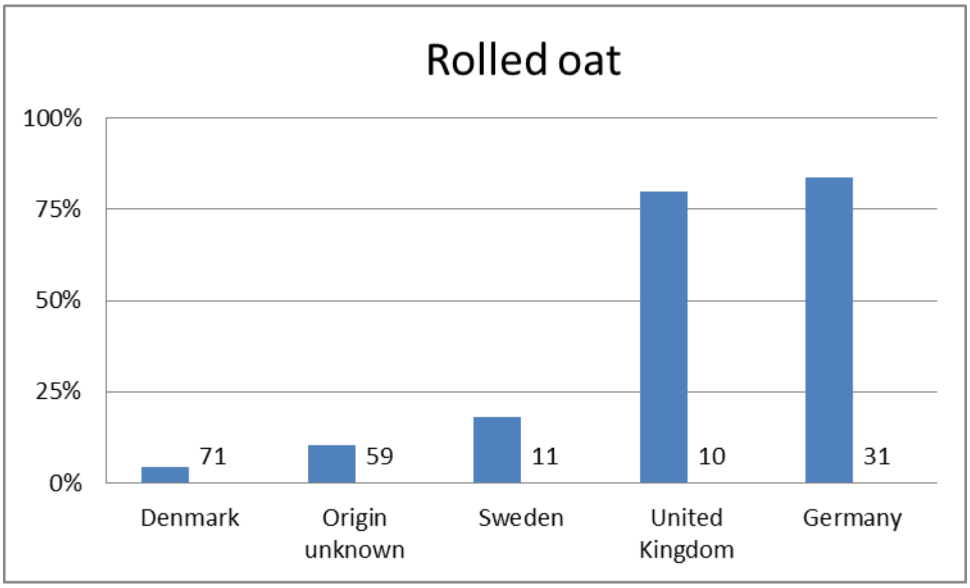

Figure 20. *Frequencies of samples with residues for rolled oat produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Wheat flour

Wheat is grown in Denmark, and approximately 40% of samples of wheat flour in the period 2004-2011 were of Danish origin. The origin of 38% of the analysed samples was unknown, but samples from Germany, Hong Kong, Italy, Lithuania, Poland, Sweden, Thailand, the United Kingdom, and Hungary were collected and analysed.

The Danish produced wheat flour had residues of 5 different pesticides in 19% of the samples (see **Figure 21**), none above the MRLs. The unknown origin and the foreign produced samples had residues of 7 different pesticides in 39% of the samples, none above the MRLs. Samples from Denmark and unknown origin had frequencies below 25%, while wheat flour samples from Italy and Germany had frequencies between 67-88%, and 10% of the foreign produced samples contained more than one residue while only 2% of the Danish produced samples had multiple residues.

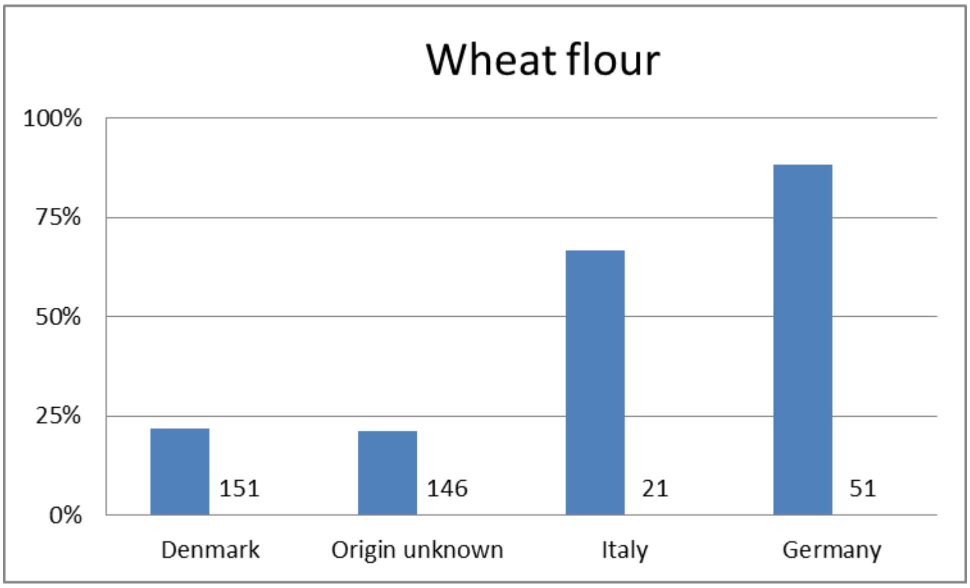

Figure 21. *Frequencies of samples with residues for wheat flour produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Wheat kernels

Wheat is grown in Denmark, and approximately 50% of the collected samples of wheat kernels in the period 2004-2011 were covered by Danish wheat kernels. The origin of 11% of the analysed samples was unknown, but samples from Czech Republic, Estonia, France, Germany, India, Kazakhstan, Netherlands, Origin unknown, Poland, Sweden, Turkey and United Kingdom were collected and analysed.

The Danish produced wheat kernels had residues of 4 different pesticides in 23% (see **Figure 22**) of the samples, none above the MRLs. The unknown origin and the foreign produced samples had residues of 9 different pesticides in 26% of the samples; none above the MRLs. Frequencies can be seen in **Figure 22** and for samples of unknown origin, Sweden and Germany, the frequencies were between 9-41%. Independent of origin, 1% of the samples contained more than one residue.

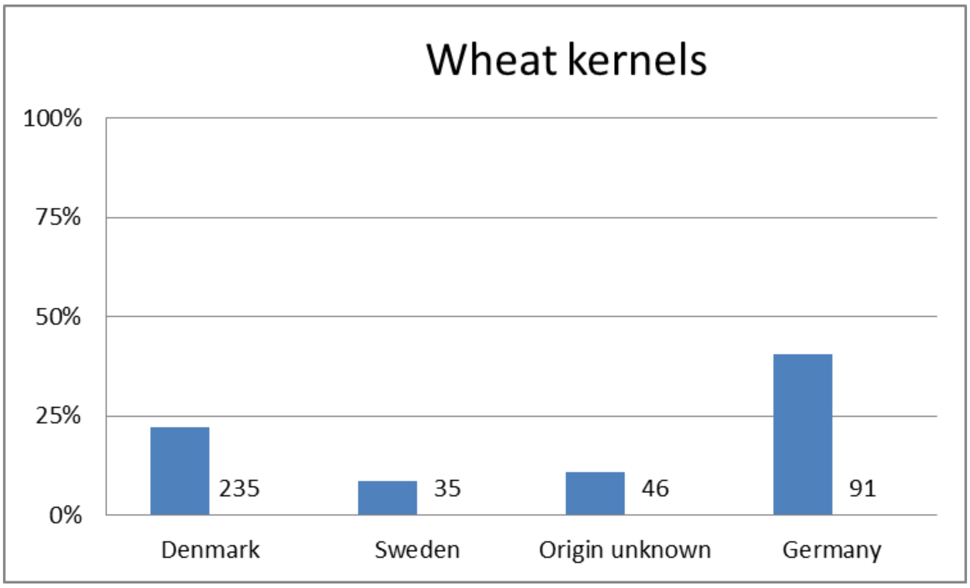

Figure 22. *Frequencies of samples with residues for wheat produced in different countries. Figures close to the bars are the number of samples analysed for the specific country.*

Products with low frequencies of samples with residues

In addition to the commodities of fruit, vegetables and cereals mentioned above, several commodities with few residues have been analysed. This included meat, organic grown products, baby food, and processed food. No pesticide residues were found in any of the meat samples or other samples of animal origin. For baby food, 66 samples were analysed, and residues were not found. Processed food contained fewer residues than the raw material used, because of peeling, cooking, mixing, etc., can decrease the concentration. However, the commodities still reflected the situation of the detection frequencies of the raw materials. Consequently, commodities like orange juice, orange marmalade, wine and raisin had high frequencies compared to other processed foods.

In the organic grown products, residues were found in 3% of the samples of fruits and vegetables and in about 1% of the samples of cereals. No residues were found in baby food, food of animal origin or processed food, (see Appendix 7.1).

Multiple residues

Residues from several different pesticides, 2-10, were found in 28% of all samples and in 98 different commodities, see **Figure 23**. Especially, citrus fruits contained multiple residues, in more than 75% of the samples. The samples with the highest number of pesticides were chili peppers from Thailand, where 10 different pesticides were detected. Another chili sample from Thailand contained 9 different pesticides, and this was also the case for two table grape samples, from Italy and Chile. Samples with 8 detected pesticides were 3 chili peppers (Spain, Thailand and Vietnam), two lettuce samples (Belgium and France), and one apple sample (France), one pear sample from Belgium and one pea with pod sample from Kenya. It should be emphasised that it is not necessarily an individual fruit or vegetable that contained all the detected pesticides, since the analysed samples are composed of more than one fruit or vegetable, e.g. at least 10 individual fruits. The composite sample can also consist of commodities produced by different growers. **Table 4** shows the commodities with multiple residues and where more than 30 samples have been analysed for the period 2004-2011.

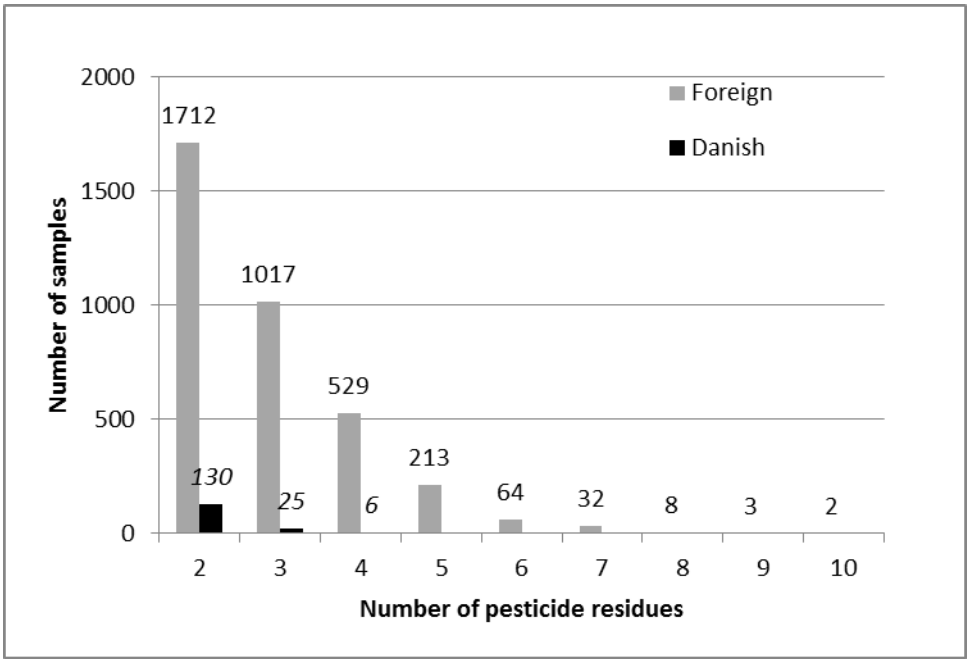

Figure 23. *Number of samples with 2-10 residues per sample for the period 2004-2011.*

Table 4. *Percentage of samples with multiple residues. Only commodity types where more than 30 samples have been analysed for the period 2004-2011 are included.*

Commodities	**Samples, multiple residues**	**Commodities**	**Samples, multiple residues**	**Commodities**	**Samples, multiple residues**
Apricots	52%	Lettuce	15%	Potatoes	1%
Apples	39%	Limes	50%	Rambutan	26%
Aubergines	11%	Mandarin, clemen-tine	93%	Raspberries	31%
Bananas	50%	Mangoes	17%	Red currants	51%
Beans with pods	18%	Melons	1%	Rice	2%
Blackberry	9%	Mushrooms, cult.	8%	Rye flour	6%
Blue berries	20%	Oat kernels	7%	Rye kernels	2%
Carrots	4%	Oranges	82%	Spelt	16%
Celery	19%	Papaya	61%	Spelt flour	17%
Chilies	48%	Parsley root	5%	Spinach	4%
Courgettes	5%	Parsnip	3%	Spring onions	17%
Cucumbers	17%	Passions fruits	37%	Star fruit	32%
Grapefruits	86%	Peaches, nectar-ines	38%	Strawberries	37%
Grapes	49%	Pears	44%	Sweet peppers	17%
Rolled oats	3%	Peas with pods	61%	Tea	13%
Kakis	7%	Peas without pods	6%	Tomatoes	19%
Kiwis	10%	Pineapples	23%	Water melons	8%
Leeks	2%	Plums	11%	Wheat flour	7%
Lemons	79%	Pomelos	61%	Wheat kernels	6%

Conclusion on residues and frequencies of the found pesticides

The overall conclusion on residues in the fruit and vegetables, responsible for the major part of the exposure to pesticides (in µg/day) is that Danish produced fruit, vegetables and cereals had lower frequencies of samples with pesticide residues, compared to products of foreign origin. It is estimated that the foreign produced commodities showed about 20% higher frequencies. Also, a smaller number of different pesticides were found in the Danish products. However, some of the foreign produced commodities had comparable detection frequencies with the Danish produced commodities, or even lower. This was the case for pears (China), plums (Argentina and France), strawberries (China, Egypt), carrots (Belgium), cucumber (Netherlands), spinach (Belgium) and rolled oat (Sweden). For other foreign produced commodities various differences between countries were observed. Residues from several different pesticides, 2-10, were found in 28% of all samples and in 98 different commodities

Pesticides found in fruit and vegetables

In Appendix 7.3 is shown which pesticides that have been found in fruit and vegetables in the period 2004-2011. **Figure 24** shows the frequencies of the most often found pesticides (> 1% of the samples).

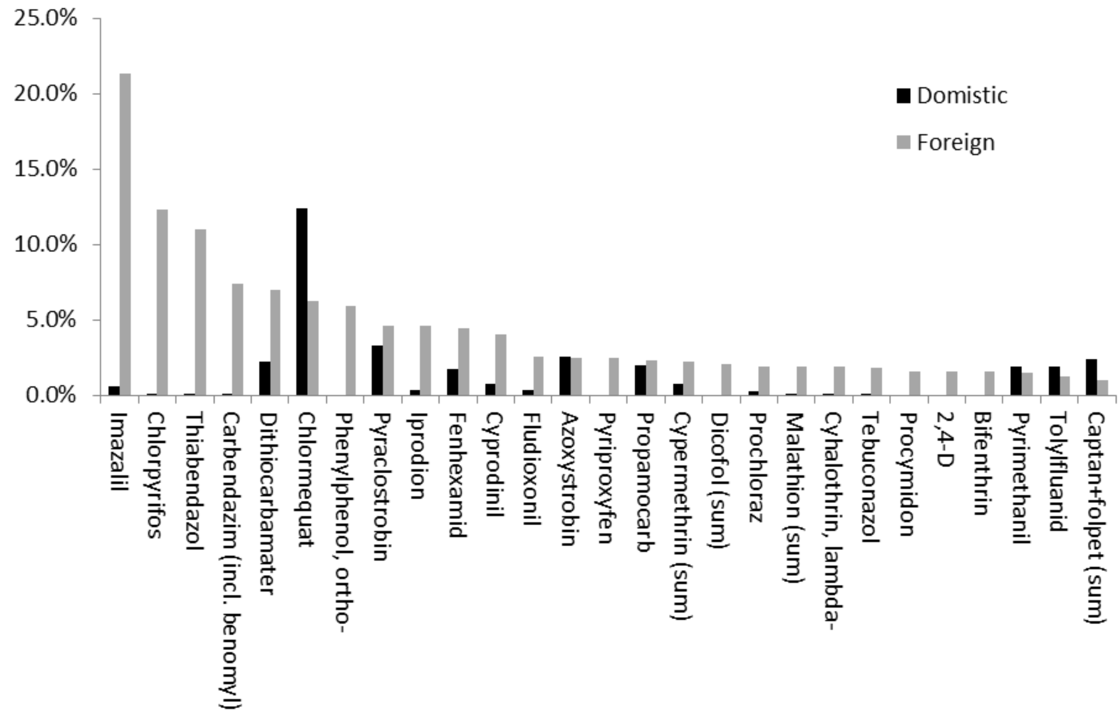

Figure 24. *Frequencies of pesticides found in fruit and vegetables higher that 1% in conventionally grown domestic, foreign or total samples. The pesticides were sought in approximately 12,500 samples), except for the following: a) dithocarbamater: 7902, not anlysed in samples with high background level of sulphur, like onion, cabbage etc., b) chlormequat: 1836, only analysed in specific commodities like fruiting vegetables, table grapes, pears, c) 2,4-D, pyraclostrobin and pyriproxyfen: 4936, included in scope from 2008, d) fenhexamid: 10461,included in scope from 2005.*

As can be seen from **Figure 24**, imazalil was the pesticide most frequently found in foreign samples. Imazalil has been analysed in more than 12,000 samples and the frequency of 21% in foreign commodities is, therefore, calculated with high certainty. Imazalil is frequently used for post-harvest treatment of citrus fruits. Apart from imazalil, chlorpyrifos, thiabendazole, carbendazim (incl. benomyl), dithiocarbamates and chlormequat were found in more than 5% of the foreign samples. In Danish samples, azoxystrobin, chlormequat, dithiocarbamates, fenhexamid, propamocarb, pyraclostrobin, pyrimethanil, tolylfluanid and the sum of captan and folpet were found in more than 1% of the samples. The relatively high frequency of chlormequat detections was caused by 50 pear samples.

Pesticides found in cereals

The analyses of cereals covers barley (grit, malting, kernels), bulgur, corn flour, maize, millet, oat (bran, kernels, rolled oat), rice (brown, rice, white, wild, flour), rye (flour, bolted, kernels), spelt (flour, grain), wheat (bran, flour, kernels). In total, 1659 samples were analysed, 691 Danish produced and 998 samples of foreign origin. Pesticide residues were found in 34% of the samples.

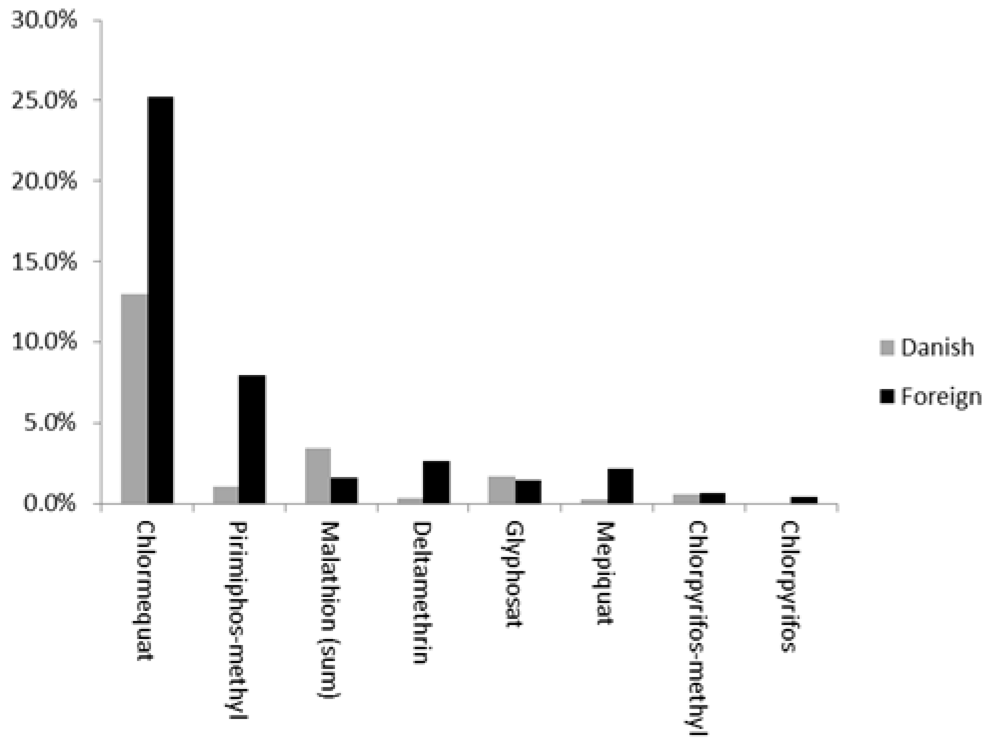

Figure 25. *Frequencies of pesticides found in conventionally grown domestic and foreign samples of cereals. The pesticides were sought in approximately 1650 samples, except for the following: a) chlormequat and mepiquat: 1764. b) glyphosate: 1375 only sought in wheat, rye, oat and barley.*

As can be seen from **Figure 25**, chlormequat was the pesticide residue most often found in both Danish and foreign samples. Glyphosate was found frequently in Danish samples and more than one third of the Danish samples have residues of glyphosate. The pesticides, detection frequencies, and reporting limits are shown in Appendix 7.2.

Comparison of pesticides found in periods 1998-2004 with 2004-2011

The pesticides, detection frequencies, and reporting limits are shown in Appendix 7.2. Below is an evaluation of the findings and possible trends from the monitoring period 1998-2003 to this period.

The findings have been investigated to see whether there were any changes in the frequencies of pesticides from the previous monitoring period 1998-2003 and this period 2004-2011. Firstly, the pesticide profile has been expanded with 90 pesticides. This resulted in detection of 51 pesticides that was not included in the scope for the period 1998-2003). Additionally, 2 pesticides, atrazine and carbofuran, were analysed in both periods but only found in samples during the period 2004-2011. Thirty pesticides found in samples for the period 1998-2003 were not found in the period 2004-2011 (see **Table 5** and **Table 6**).

Table 7 shows the list of pesticides that were scarcely detected in the period 2004-2001 (>20 detection) and also scarcely detected in the period 1998-2003 and **Table 8** shows the pesticides that were not detected in the period 2004-2011.

Table 5. *Pesticides detected in samples analysed in the period 2004-2011, but not in the period 1998-2003*

Pesticides analysed in both 1998-2003 and 2004-2011		
Atrazine	Carbosulfan	
Pesticides analysed only in 2004-2011		
Acetamiprid	Fenhexamid	Propamocarb
Aclonifen	Fluoxastrobin	Propoxur
Aldicarb	Fluroxypyr	Propyzamide
Benalaxyl	Flusilazole	Pymetrozine
Chlorthal-dimethyl	Flutriafol	Pyraclostrobin
Clofentezine	Hexaconazole	Pyridate
Cyromazine	Hexythiazox	Pyriproxyfen
Dichlorprop	Iprovalicarb	Quinoxyfen
Diethofencarb	Linuron	Quizalofop
Diflufenican	Mecoprop	Spiroxamine
Dimethomorph	Methacrifos	Tebufenozide
Diniconazole	Methiocarb	Tebufenpyrad
Epoxiconazole	Methomyl and Thiodicarb	Tetraconazole
Ethoxyquin	Metribuzin	Triallate
Famoxadone	Oxamyl	Triflumuron
Fenazaquin	Oxydemeton-methyl	2,4-D
Fenbuconazole	Pendimethalin	Pyridaben

Table 6. *Pesticides detected in samples analysed in the period 1998-2003, but not in the period 2004-2011*

Pesticides		
Azinphos-ethyl	Etrimfos	Parathion
Biphenyl	Furathiocarb	Pentachloroanisole
Chinomethionat	Heptachlor	Pyrazophos
Chlorobenzilate	Isofenphos	Simazine
Chloropropylate	Mecarbam	Tetrasul
Demeton-S-methyl	Methoxychlor	
Dioxathion	Nuarimol	

Table 7. *Pesticides with less than 20 detection in the period 2004-2011 and similar detection frequencies in the period 1998-2003*

Pesticides		
Aldrin and Dieldrin	Dichlorvos	Monocrotophos
Benfuracarb	Dicloran	Phorate
Binapacryl	Fenarimol	Propiconazole
Buprofezin	Fenpropathrin	Pyrazophos
Captafol	Fenpropimorph	Quinalphos
Carbaryl	Flucythrinate	Tecnazene
Carbofuran	Fluvalinate, tau-	Tolclofos-methyl
Chlorfenvinphos	HCH	Triazophos
Chlorpropham	Hexachlorobenzene	Trichlorfon
Cyfluthrin	Lindane	
DDT	Mevinphos	

Table 8. *Pesticides not detected in samples analysed in the period 2004-2011*

Pesticides		
2-Naphthoxyacetic acid 1)	Endrin 1)	Nitrofen
4-Chlorophenoxy acetic acid	Ethiofencarb	Nuarimol 2)
Acrinathrin	Etrimfos 2)	Ofurace
Azimsulfuron	Fenamiphos (sum)	Oxadixyl
Azinphos-ethyl 2)	Fenchlorphos (sum)	Oxycarboxin
Bentazone (sum)	Fenpropidin 1)	Paclobutrazol
Bromophos 1)	Fluazifop-P-butyl (sum)	Parathion 2)
Bromophos-ethyl 1)	Flufenacet (sum)	Pentachloroanisole 2)
Bromoxynil	Flupyrsulfuron-methyl	Pentachlorothioanisole 1)
Bromuconazole (sum)	Fluquinconazole	Phenkapton 1)
Carbophenothion 1)	Flurtamone	Phosphamidon 1)
Carboxin	Flutolanil	Phoxim 1)
Chinomethionat 1)	Fonofos	Picolinafen
Chlorfenson 1)	Formothion 1)	Picoxystrobin
Chlorobenzilate 2)	Fuberidazole	Pirimiphos-Ethyl
Chloropropylate 2)	Furathiocarb	Propanil
Cinidon-ethyl (sum)	Heptachlor (sum) 2)	Propham
Clethodim	Heptenophos 1)	Proquinazid
Clodinafop-Propargyl	Iodosulfuron-methyl	Pyrazophos 2)
Cyproconazole	Isofenphos 2)	Pyridaphenthion
Demeton-S-Methyl 2)	Isofenphos-Methyl	Simazine 2)
Dialifos	Isoproturon	Sulfotep 1)
Dichlofenthion 1)	Jodfenphos 1)	TEPP 1)
Dimoxystrobin	Mecarbam 2)	Tetrasul 2)
Dinoterb	Methoxychlor 2)	Thiometon

Pesticides		
Dioxathion 2)	Metribuzin	Trifluralin
Ditalimfos 1)	Molinate	Triticonazole
DNOC	Monolinuron	Vamidothion 1)

1) Analysed in the period 1998-2003, not detected
2) Analysed in the period 1998-2003 and detected

Table 9 shows increases or decreases of detection frequencies. It is not indicated if the frequencies have decreased or increased. This table includes pesticides that were often found in samples analysed in in the period 1998-2003 and/or the period 2004-2011. The table also includes data on the increase/decrease of the exposure in µg/person/day for the pesticides. A significant increase/decrease in the frequency of a pesticide will not necessarily result in a significant increase/decrease in the exposure. This will be the effect if the detected levels of pesticides were low or high compared to the levels analysed earlier. The effect depends also on the commodities in which the pesticide is found.

Nine pesticides were found significantly more often in the period 2004-2011, namely acephate, azoxystrobin, bitertanol, bupirimate, chlorpyrifos-methyl, lambda-cyhalothrin, myclobutanil, tebuconazole and trifloxystrobin. The increase of detection of these pesticides resulted in an increase of the exposure, except for bitertanol. Also for difenoconazole, penconazole, prochloraz, profenofos and thiabendazole a clear increase in both frequencies and exposure were seen. For the rest of the pesticides in **Table 9**, the increases and decreases are not significant. However, the exposure for deltamethrin, kresoxim-methyl, pirimiphos-methyl,, triadimefon+triadimenol and pyrimethanil was significantly higher (increased more than 200%) even though the frequencies were not.

Table 9. *Trends in pesticides found and the resulting exposure from the period 1998-2003 to the period 2004-2011.*

Pesticide	Less than 20 detections in 1998-2003	Less than 20 detections in 2004-2011	Change in frequency of detection [1)]	Change in exposure (µg/day) [1)]
Acephate	*		+++	+++
Azoxystrobin	*		+++	+++
Bitertanol	*		+++	-
Bupirimate	*		+++	+++
Chlorpyrifos-methyl	*		+++	++
Cyhalothrin, lambda-	*		+++	+++
Myclobutanil			+++	+++
Tebuconazole			+++	++
Trifloxystrobin	*		+++	+++
Difenoconazole	*		++	+
Penconazole	*		++	++
Prochloraz			++	+++
Profenofos	*		++	+
Thiabendazole			++	+
Azinphos-methyl			+	++
Bifenthrin			+	-
Chlorpyrifos			+	+
Cypermethrin			+	+
Deltamethrin			+	+++
Dicofol			+	-
Diphenylamine			+	+
Imazalil			+	-
Kresoxim-methyl	*		+	+++
Methamidophos			+	++
Pirimicarb			+	+
Pirimiphos-methyl			+	+++
Triadimefon+triadimenol			+	+++
Bromopropylate			-	-
Carbendazim and benomyl		*	-	+
Chlormequat			-	-
Chlorothalonil			-	+
Cyprodinil			-	+
Diazinon			-	+
Dimethoate+omethoate			-	+
Dithiocarbamates			-	+

Pesticide	Less than 20 detections in 1998-2003	Less than 20 detections in 2004-2011	Change in frequency of detection [1)]	Change in exposure (µg/day) [1)]
Endosulfan			-	-
Ethion		*	-	-
Fenitrothion			-	-
Fenthion		*	-	-
Fludioxonil			-	+
Glyphosate			-	-
Iprodione			-	++
Malathion			-	-
Mepiquat	*		-	+
Metalaxyl		*	-	-
Methidathion			-	-
Parathion-methyl			-	-
Phosalone			-	-
Phosmet			-	+
Procymidone			-	-
Propargite	*		-	-
Pyrimethanil			-	+++
Quintozene			-	+
Tetradifon		*	-	-
Tolylfluanid			-	-
Vinclozolin			-	-

[1)]

+++	> 200%
++	100-200%
+	0-99%
-	<0%

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4.3 Exposure

Dietary exposure and risk assessment

The dietary exposure to pesticides has been calculated in order to assess the chronic (long-term) consumer health risk for the Danish population. To follow the trend in exposure over time, the exposure calculation has been calculated according to the approach of National Estimated Daily Intake given in “Guidelines for predicting dietary intakes of pesticides residue” (WHO, 1997).

The primary goal of the effort has been to assess whether the pesticide residues present in an average Danish diet is acceptable from a food safety point of view. For this reason, estimations that will give conservative (i.e. pessimistic) results were preferred to the contrary. If such estimates point to food safety problems, further refinements of the methods used must be performed to assess whether such problems are real, or just artefacts from a too simple model.

The dietary exposure to a pesticide residue in a given food was estimated by multiplying the residue level in the food by the amount of that food consumed. Residues were obtained from the Danish monitoring programme while consumption data were obtained from the Danish National Dietary Survey. The total dietary exposure to a given pesticide was estimated by summing the exposure for all food items containing residues of that pesticide. The exposure for each food item (*i*) is calculated, relative to the body weight (*w*) from the average residue concentration (*Ci*) in the food item, multiplied by the consumption (*Mi*) of the food item:

$$Exposure = \frac{C_1 * M_1 + C_2 * M_2 + C_3 * M_3 + \cdots + C_i * M_i}{w}$$

In the risk assessment of the chronic exposure, the estimated total dietary exposure was compared with the toxicological reference value, Acceptable Daily Intake (ADI). ADI is the estimated maximum amount of a substance to which an individual in a (sub) population may be exposed daily over its lifetime without appreciable health risk (from WHO). A more detailed description of the exposure calculations can be found in Annex 6.1.

Consumption data

Exposure estimates were based on consumption data obtained from the Danish National Dietary Survey 2003-2008 (Pedersen et al., 2010). This cross-sectional survey included 2700 participants aged 4-75 years old drawn from the Danish Central Person Register. The participants can be characterised as close to representative for the Danish population. In this report, the consumer groups, children aged 4-6 years and adults, women and men aged 15-75 years, will be used.

The consumption data used for the exposure calculations for different consumer groups are shown in Appendix 7.4. It is not possible from the consumption data, to distinguish between consumption of commodities of Danish and foreign origin. Therefore, the distribution between domestic and foreign as well as the distribution between the foreign food commodities has been assumed to follow the distribution of samples in the monitoring programmes.

Residue data

As previously described, the residue data included a total of 17309 samples. The pesticides in the monitoring programme were found in about 130 different commodities.

An average content has been calculated for each combination of pesticide, commodity and origin (domestic or foreign). Only combinations of pesticide/commodity/origin with at least one detectable residue above LOR were included in the calculations of exposure.

In many circumstances, no detectable amount of pesticides was found, but this does not necessarily mean that the content is zero. The content may just be too low for detection with the available methods, or in other words, below the level of reporting. No exact method for estimation of the contribution from such non-detects exists. Different methods can be applied and is has been the most common to use zero for non-detects. In more and more circumstances, the exposure is, however, calculated using different assumptions e.g. zero and ½LOR for non-detects to indicate a lower bound and upper bound for the exposure (ANSES, 2011).

In some cases, correcting for samples without detected residues leads to a very high correction. This is, especially the case when many samples have been analysed, but only a few samples with residues were detected. Therefore a model was chosen where the difference between the dietary exposure with, and without, correction for non-detects is not allowed to be more than a factor of 25. This means that if the correction is more than a factor of 25 it is adjusted down to 25. The background for the correction factor of 25 is described in Annex 6.2.

To obtain the most realistic picture of the exposure to pesticides, it is also important to address processing factors. The pesticides included in the calculations were found in commodities such as citrus fruits, banana, water melon, and pineapples, for which processing factors for peel/pulp distribution are normally applied in a refined exposure calculation. For comparison two scenarios were performed: one where no processing factors were included and another, where processing factors were included. The processing factors used in this report were the same as those used in the report for the monitoring period 1998-2003 (Poulsen et al., 2004). For thiabendazole and the benomyl group a processing factor of 0.25 was used, while a factor of 0.1 was used for all the other pesticides (see Appendix 7.6).

Estimation of the cumulative exposure and risk assessment

There is no internationally agreed method for risk assessment of the cumulative exposure to multiple residues of pesticides. In the present report, assessments of exposure to a mixture of pesticides were performed by using the Hazard Index (HI) method as described by US EPA (1986a), Wilkinson et al. (2000), Reffstrup et al. (2010), and Kortenkamp et al. (2012). The HI is the sum of Hazard Quotients (HQ) for the individual pesticides. The HI method assumes that the effects following cumulative exposure can be predicted by the mathematical model of dose-addition (Wilkinson et al., 2000) and is designed for risk assessment for substances which have the same effect or common mode of action, e.g. the organophosphor pesticides or the triazole group. As the HI method assumes the same kind of adverse effect for all the detected pesticides, it is a relatively conservative (precautionary) approach for cumulative risk assessment. However, as described by Kortenkamp et al. (2012) and Reffstrup et al. (2010) the method can be used even when the substances have dissimilar toxicological endpoints. The results should then be interpreted with caution.

The Hazard Quotient (*HQ*) for a given pesticide is calculated from the total exposure from the diet to that pesticide divided by the ADI for that pesticide:

$$Hazard\ Quotient\ (HQ) = \frac{Exposure}{ADI}$$

The Hazard Index (*HI*) for a given diet is calculated by summing the Hazard Quotients (*HQ*) for each pesticide (*p*) in the diet:

$$Hazard\ Index\ (HI) = HQ_1 + HQ_2 + HQ_3 + \cdots + HQ_p$$

Throughout the present report, the term HI will be used for the sum of HQs from the pesticides that the consumer is exposed to. If the HI exceeds 1 (or 100%), the mixture has exceeded the maximum acceptable level and there might thus be a risk (Reffstrup et al., 2010).

The ADIs used for calculation of the HQs for the individual pesticides are those accepted in the EU (Commission (COM) or EFSA) or by JMPR when available (see Appendix 7.5). For pesticides where an accepted ADI was not available, the ADI proposed by the Rapporteur Member State in the Draft Assessment Report (DAR) has been used for calculation of the HQ. No ADIs were available for about ten pesticides and therefore, these substances have not been included in the cumulative risk assessment based on HI.

Results and discussion of exposure calculations

In **Table 10** is shown the average exposure in µg/kg bw/day and in µg/day/person for the adult population using different assumptions in the calculations. The exposure for adults is between 0.9 µg/kg bw/day (correction for processing, no correction for non-detects) and 3.0 µg/kg bw/day (no correction for processing, all non-detects = ½ LOR). For children, the same figures are between 2.0 and 6.6 µg/kg bw/day.

Table 10. *Average exposure for the consumer groups "Adults" (15-75 years) and "Children" (4-6 years) using different models (LOR: Limit of reporting)*

	Exposure		
Correction for undetected residues:	No correction	½LOR for non-detects; Correction factor limited to 25	½LOR for non-detects
		(µg/kg bw/day)	
Adults, no reduction for peeling	1.4	2.6	3.0
Children, no reduction for peeling	2.9	5.7	6.6
Adults	0.9	**1.9**	2.3
Children	2.0	**4.5**	5.3
		(µg/day)	
Adults, no reduction for peeling	105	192	222
Children, no reduction for peeling	62	124	144
Adults	68	**146**	171
Children	44	**98**	116

In **Table 11** is shown the HI for adults (15-75 years) and children (4-6 years) using different assumptions in the calculations. For adults, the HI is calculated to be between 4% and 44% and for children, the HI is between 10% and 124%. As can be seen from **Table 10**, using

½LOR in the calculations has a very big impact on the exposure, as well as on HI. It can also be seen that using ½LOR has a higher impact on the exposure and HI, than including processing factors.

For children, the worst case calculation leads to a HI above 100%. However, as mentioned above, an examination of the details leading to this result shows clear indications of over-correction for non-detected residues (see Annexes 6.1 and 6.2). Using Model 3 in Annex 6.1 (with limiting factor 25 on corrections for non-detects), HI for children has been calculated to be 56% (44% with reduction for processing), which is below the critical value of 100%.

Table 11*. Hazard Index (HI) for the consumer groups "Adults" (15-75 years) and "Children" (4-6 year) using different models (LOR: Limit of reporting)*

	Hazard Index		
Correction for undetected residues:	No correction	½LOR for non-detects; Correction factor limited to 25	½LOR for non-detects
Adults, no reduction for peeling	7%	23%	49%
Children, no reduction for peeling	14%	56%	124%
Adults	4%	**18%**	42%
Children	10%	**44%**	108%

As mentioned above it was evaluated that if ½LOR was used in the calculations, the most suitable model for this was the model where corrections for non-detects were limited to a factor of 25. In this case, it was taken into consideration that levels below the LOR could be higher than zero. At the same time, it was taken into consideration that a few positives will not have an unrealistic high impact on the exposure; e.g. that 2-3 residues above the LOR out of maybe 400 samples would mean that 397-398 samples were calculated as having contents of ½LOR.

Furthermore, it has been evaluated that the most realistic exposure calculation was obtained by using processing factors in the calculation. A processing factor of 0.1 has been used for most of the relevant pesticide/crop combinations. This represents some uncertainty because processing factors will be different depending on the pesticide/crop combination.

Unless otherwise stated, the calculations in this report have been performed using the model: corrections for non-detects were limited to a factor of 25 and processing factors were included.

In **Table 12** is shown the average exposure in µg/kg bw/day and in µg/person/day and the Hazard Index for the consumer groups 'children, adults, men, and women' using the chosen model. The results show that children have the highest exposure per kg bw followed by women, adults and men. The reason for the highest exposure for children is that they consume relatively more per kg bodyweight, compared to adults. Due to the fact that women consume more fruit and vegetables than men (see Appendix 7.4) they have a higher exposure than men. Since the exposure per kg bw is highest for children, the HI is also highest for children. It is seen from **Table 12** that the HI for children is more than twice as high as for women and about 3 times higher than for men, but still well below 100%.

__Table 12__. Average exposure and Hazard Index (HI) for adults, men, women and children (Correction for non-detected residues; correction factor limited to 25).

	Exposure (µg/kg bw/day)	Exposure (µg/person/day)	Hazard Index
Adults, 15-75 years	1.9	146	18%
Men, 15-75 years	1.6	134	14%
Women, 15-75 years	2.2	151	20%
Children, 4-6 years	4.5	98	44%

Commodities that contributes most to the exposure

The contribution of each commodity to the exposure as well as the HI has been calculated for the consumer group “Adults” and “Children”. In Appendix 7.7 and 7.8 details are shown for individual commodities. In **Table 13**, the exposure and HI is shown for the 25 commodities that contribute most to the exposure for the consumer group “Adults”. The exposure is shown both in µg/kg bw/day and in µg/day. As can be seen, the sum of HI constitutes about 97% of the total HI and about 95% of the total exposure. It should be noted that the consumption of a specific commodity can have a big impact on the HI. Thus, the HI can be high for a commodity consumed in high amounts even though the concentrations of the pesticides in this commodity are lower, compared to the concentrations of the pesticides found in other commodities. For example, for the consumer group “Adults”, table grapes contribute to the HI by 0.74%, which is about 2.7 times more than the contribution from kiwi (0.27%). The consumption of table grapes is higher than for kiwis. If the consumption of table grapes and kiwis was the same then kiwis would contribute about 50% more to the HI than table grapes.

__Table 13.__ Exposure and Hazard Index (HI) for the group "Adults" and the 25 commodities that contribute most to the Hazard Index.

Commodity	Exposure (µg/kg bw/day)	Exposure (µg/person/day)	Hazard Index
Apples	0.57	43	6.9%
Wheat flour	0.22	16	1.3%
Tomatoes	0.15	11	1.2%
Pears	0.14	11	1.15%
Carrots	0.037	2.7	1.0%
Table grapes	0.1	8.4	0.74%
Cucumbers	0.053	4.1	0.69%
Wine, red	0.11	8.4	0.48%
Rye flour	0.032	2.4	0.44%
Peppers, sweet	0.033	2.5	0.31%
Nectarines	0.031	2.3	0.30%
Peaches	0.032	2.4	0.28%
Oranges	0.030	2.2	0.28%
Kiwi	0.044	3.3	0.27%
Lettuce	0.063	4.8	0.26%
Pineapples	0.020	1.5	0.24%
Peas without pods	0.0084	0.63	0.24%

Commodity	Exposure (µg/kg bw/day)	Exposure (µg/person/day)	Hazard Index
Mandarins, clementines	0.030	2.2	0.21%
Potatoes	0.055	4.1	0.17%
Plums	0.017	1.3	0.12%
Beans with pods	0.0052	0.39	0.12%
Teas	0.0047	0.35	0.12%
Strawberries	0.023	1.8	0.11%
Melons	0.0051	0.39	0.08%
Oranges, juice	0.016	1.2	0.07%
Sum	1.8	138	17%
Total	1.9	146	18%
% of total	95%	95%	97%

Figure 26 shows the nine commodities that contribute most to the exposure for “Adults” together with the contributions from the rest of the commodities (“Others”).

Figure 27 shows the same for the commodities that contributes most to the HI for “Adults”. The seven commodities, apples, wheat flour, tomatoes, pear, table grapes, red wine and cucumber contribute most to both exposure and HI. Carrots and rye flour are in the ‘top nine’ when comparing HI, while lettuce and potatoes only are in the ‘top nine’ when comparing exposure. This difference reflects the different types of pesticides (with different ADIs) that were found in the different commodities. Apples contribute most to both the exposure and to HI.

Pesticides that contributes most to exposure

The contribution of each pesticide to the exposure, as well as the HI has been calculated using the chosen model. In Appendices 7.8 and 7.9, details are shown for individual pesticides. The HQs for the individual pesticides ranged from 0.00001% to 2.4% with most of the HQs being below 1% (see Appendix 7.9) indicating that there is no risk of adverse effects following exposure to the individual pesticides. Furthermore, the HI of 18% for adults and 44% for children is not considered to indicate a risk of adverse effects following a cumulative exposure to all the detected pesticides.

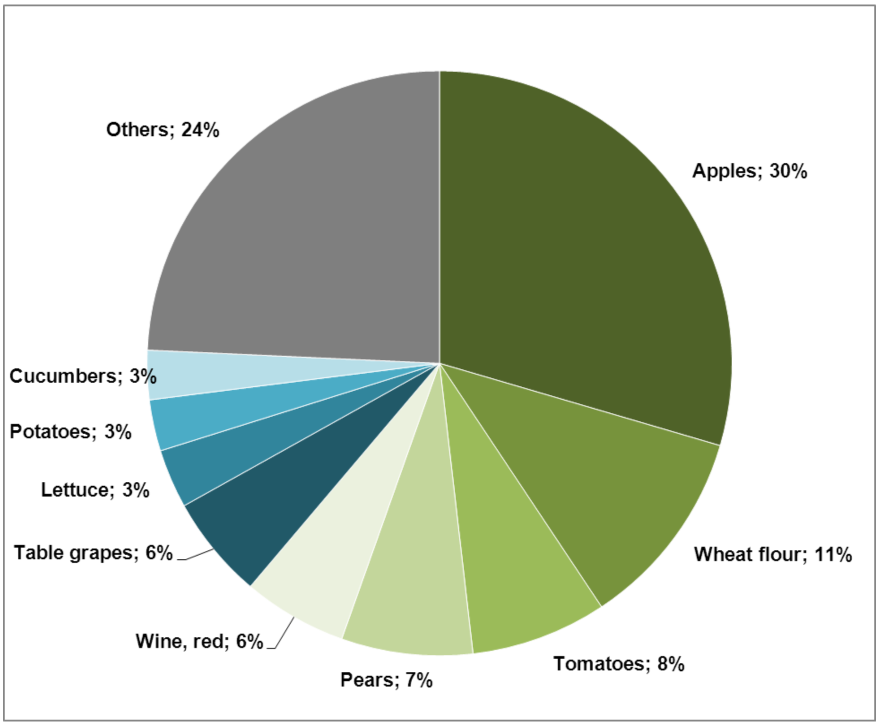

Figure 26*: Relative contribution of* ***commodities*** *to total* ***exposure*** *to pesticide residues in the diet. Consumer group: Adults; estimated total exposure: 1.9 µg/kg bw/day. "Other" represents 78 different commodities.*

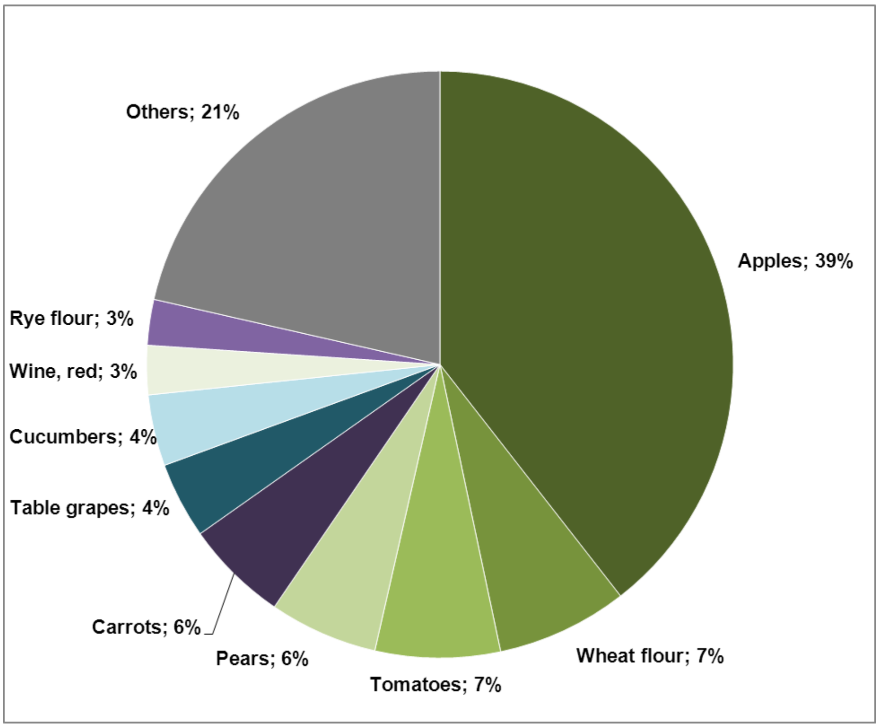

Figure 27*: Relative contribution of* ***commodities*** *to* ***Hazard Index*** *for pesticide residues in the diet. Consumer group: Adults; estimated diet Hazard Index: 18%. "Other" represents 78 different commodities.*

In **Table 14**, the HQs and exposure for the 20 pesticides that have the highest HQ for the consumer group “Adults” are shown. The exposures are shown, both in µg/kg bw/day and in µg/day. The sum of HQ constitutes about 72% of the total HI and about 33% of the total exposure. There is a big difference in ordering the pesticides according to exposure or HQ, which is due to differences in their ADI; e.g. as shown in **Table 14**, imazalil contributes most to the exposure, while diazinon has the highest HQ. For some pesticides, the exposure is calculated to be higher than for the pesticides shown in **Table 14**, but the HQ is so low that this pesticide is not among the 20 pesticides with highest HQ values; e.g. the exposure for pyrimethanil is 3.18 µg/person/day, but the HQ is only 0.028%.

Table 14. Exposure and Hazard Quotients (HQ) for the group "Adults" and the 20 pesticides that contribute most to the Hazard Index.

Pesticide name	Exposure (µg/kg bw/day)	Exposure (µg/person/day)	Hazard Quotient
Diazinon	0.0047	0.35	2.4%
Omethoate	0.0039	0.29	1.3%
Pirimiphos-methyl	0.043	3.2	1.1%
Dicofol (sum)	0.017	1.3	0.86%
Phosmet (sum)	0.021	1.6	0.69%
Procymidone	0.018	1.34	0.64%
Dimethoate	0.0063	0.48	0.63%
Propargite	0.061	4.6	0.61%
Carbaryl	0.043	3.2	0.57%
Chlorfenvinphos	0.0028	0.21	0.57%
Azinphos-methyl	0.022	1.7	0.44%
Carbendazim and benomyl	0.087	6.5	0.43%
Dithiocarbamates	0.21	16	0.42%
Linuron	0.010	0.76	0.34%
Methomyl and thiodicarb	0.0083	0.62	0.33%
Bitertanol	0.0090	0.67	0.30%
Methamidophos	0.0029	0.22	0.29%
Imazalil	0.072	5.4	0.29%
Oxamyl	0.0026	0.19	0.26%
Oxydemeton-methyl (sum)	0.00074	0.055	0.25%
Sum[1]	0.65	48	13%
Total	1.9	146	18%
% of total	33%	33%	72%

In **Figure 28**, is shown the 9 pesticides that contribute most to the exposure together with the contributions from the rest of the commodities (“Others”).

Figure 29 shows the same for the pesticides that contribute most to the HI.

[1] *Summing has been performed using more decimals on individual exposures/HQs that shown in the table.*

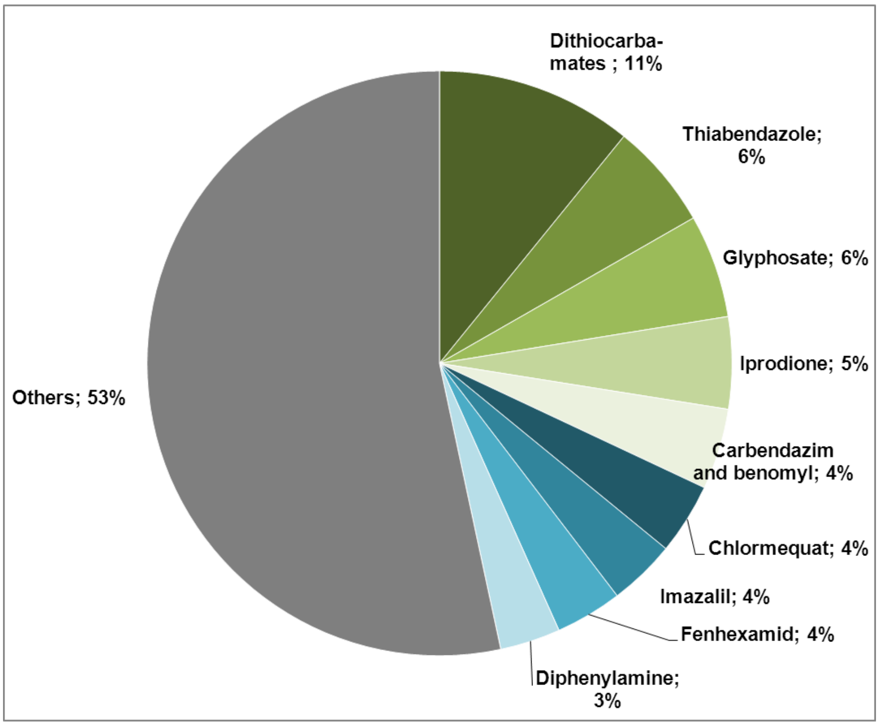

***Figure 28**: Relative contribution of **pesticides** to total **exposure** to pesticide residues the diet. Consumer group: Adults; estimated total exposure: 1.9 µg/kg bw/day. "Other" represents 148 different pesticides.*

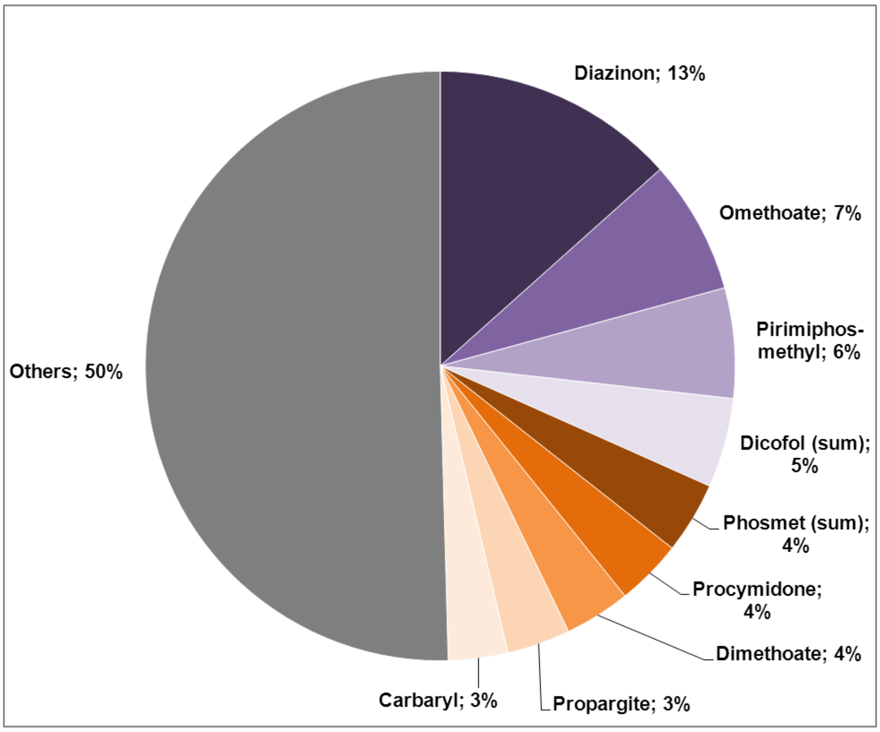

***Figure 29**: Relative contribution of **pesticides** to **Hazard Index** for pesticide residues in the diet. Consumer group: Adults; estimated Hazard Index: 19%. "Other" represents 148 different pesticides.*

In contrast to what was the case for commodities, the pesticide in the two ‘top nine’ groups are all different. The ‘top nine’ pesticides in both cases account for approximately half of the exposure (or HI), while the ‘top nine’ commodities accounted for approximately 75%.

Effect from origin of commodities on exposure to pesticide residues

Some commodities originate only from foreign countries e.g. oranges, while some commodities, e.g. apples, are produced both in Denmark and in foreign countries. As seen in **Figure 2** and Figure 3, fruit and vegetables from the EU and third countries have a higher frequency of pesticide residues compared to fruit and vegetables from Denmark. Therefore, the origin of the commodities can have an effect on the exposure to pesticides in µg/day, as well as the HI.

The exposure to pesticides has also been calculated assuming that the consumers eat commodities of Danish origin whenever possible, e.g. only Danish apples and pears, but oranges from other countries. The results of such calculation are shown in **Table 15**, both with regards to exposure and HI. The results show that both the average exposure per day and HI then decrease compared to eating commodities of both Danish and foreign origin. Since Danish commodities in general have lower contents and lower frequencies of pesticide residues compared to commodities of foreign origin, the average exposure can be expected to be lower when Danish commodities are eaten whenever possible. However, because of the use of ½LOR the correction for commodities of foreign origin may be overestimated in some cases. If a single residue was found in a commodity from a single country all residues of this commodity were corrected, independent of the country of origin.

Effect on exposure for consumers having a high consumption of fruit and vegetables

In Denmark, the Danish Food and Veterinary Administration recommend that everyone above 10 years of age, eat 600 g of fruit and vegetables per day. Calculations have been performed to investigate what effect a high consumption of fruits and vegetables has on the exposure to pesticides for the two consumer groups, men and women. The calculations were performed by taking all the participants in the food dietary survey who consumed more than 550 gram of fruits and vegetables (excluding potatoes) and calculate the exposure for these persons (high consumers). **Table 15** shows the exposure and HI for the high and the average consumers using the chosen model. It is observed that the exposure increases, about a factor of 1½-2 for both women and men. For the high consumers, men had the highest exposure, whereas, for the average consumers, it was women.

Table 15. *Exposure and Hazard Index (HI) for normal consumers and for consumers with high consumption of fruit and vegetables (above 550 g/day excluding potatoes) as well as consumers that choose Danish grown commodities whenever possible* [a)].

Consumer group	Exposure (µg/kg bw/day)	Exposure (µg/day)	Hazard Index
Adults, average consumption	1.9	146	18%
Adults, average consumption, domestic preferred	1.0	76	8%
Men, average consumption	1.6	134	14%
Men, average consumption, domestic preferred	0.8	67	6%
Men, high consumption	3.19	261	29%
Men, high consumption, domestic preferred	1.5	125	13%
Women, average consumption	2.2	151	20%
Women, average consumption, domestic preferred	1.2	80	10%
Women, high consumption	3.5	240	33%

Consumer group	Exposure (μg/kg bw/day)	Exposure (μg/day)	Hazard Index
Women, high consumption, domestic preferred	1.8	125	16%
Children, average consumption	4.5	98	44%
Children, domestic preferred	2.4	52	20%

a) i.e. commodities where domestic samples have been analysed (see Appendix 7.4)

Comparison of exposure and Hazard Index for the two periods 1998–2003 and 2004–2011

The exposure has also been calculated in the reports for the two monitoring periods 1993-1997 and 1998-2003 (DVFA, 2000 and Poulsen et al., 2005), while the HI has only been calculated in the report for the period 1998-2003, and in the present report. The model for exposure calculation is the same in the present report as in the report for the previous period 1998-2003. Because the model for exposure calculation was not the same for the first period and, because of a large increase in the number of pesticides analysed, it was decided only to make a comparison for the exposure and HI for the two periods 2004-2011 and 1998-2003.

The model for exposure calculation was the same for the two periods, but the number of pesticides, reporting limits, commodities with consumer data and ADIs were not quite the same for the two periods:

Pesticide profile: The present study included and detected a higher number of pesticides. Since 2003, the number of pesticides in the monitoring programme has increased from 153 pesticides to about 275 pesticides including metabolites.

Reporting limits: In some cases reporting limits were different between the two periods. Some were lower, some were higher. This might influence the differences between the two periods.

Commodities with consumptions data: The present study included a higher number of commodities with consumption, about 130 commodities, while only about 90 commodities were included for the previous period. However, the 25 commodities that contributed most to the exposure were included in both periods. Consumption data from the survey performed in the period 2003-2008 were used in the present study while consumption data from the period 2000-2002 were used in the previous period.

ADIs: the ADIs for the substances have changed for some of the substances.

Age groups: Estimation of exposure was performed for children aged 4-14 in the report from the period 1998-2003, while the calculation was performed for children aged 4-6 in this study. Children eat relatively more per kg bodyweight compared to adults, hence children aged 4-6 have a higher exposure per kg bodyweight compared to children aged 4-14.

Table 16 shows the average exposure for men, women and children for both periods.

Table 16 *Comparison of the average intake and HI for men, women and children using the chosen model for the two monitoring periods 1998-2003 and 2004-2011*

	Exposure (µg/kg bw/day)	Exposure (µg/day)	Hazard Index
Exposure, 2004-2011			
Men, 15-75 years	1.6	134	14%
Women, 15-75 years	2.2	151	20%
Children, 4-6 years	4.5	98	44%
Exposure, 1998-2003			
Men, 15-75 years		124	19%
Women, 15-75 years		137	26%
Children, 4-14 years		103	35%

For adults a minor increase in the calculated exposure and a decrease in Hazard Index were observed. However, due to the uncertainties and the different basis for the calculations in the two periods a clear conclusion on the changes cannot be drawn.

For children the calculations have been performed for two different age groups in the two periods, and therefore it is not possible to compare the results.

It should be noted that a detailed analysis has not been performed to clarify the observed differences.

However, in relation to these comparisons it should be emphasised that the HI was below 100% for all consumer groups in both periods

Table 17. Hazard Quotients (HQ) for the 20 pesticides that contribute most to the Hazard Index for the consumer group “Adults”, present vs. last periode.

Pesticide name	Hazard Quotient 2004-2011	Hazard Quotient [a)] 1998-2003	Status under 1107/2009
Diazinon	2.4%		Not approved (2007)
Omethoate	1.3%	0.49%	Not approved (2002)
Pirimiphos-methyl	1.1%		Approved
Dicofol (sum)	0.86%	2.7%	Not approved (2008)
Phosmet (sum)	0.69%	0.20%	Approved
Procymidone	0.64%		Not approved (2009)
Dimethoate	0.63%	0.49%	Approved
Propargite	0.61%	1.4%	Not approved (2008)
Carbaryl	0.57%	0.23%	Not approved (2007)
Chlorfenvinphos	0.57%	1.16%	Not approved (2002)
Azinphos-methyl	0.44%		Not approved (2005)
Carbendazim and benomyl	0.43%	0.37%	Approved
Dithiocarbamates	0.42%	1.2%	Some approved
Linuron	0.34%		Approved
Methomyl and Thiodicarb	0.33%		Approved
Bitertanol	0.30%		Approved

Pesticide name	Hazard Quotient 2004-2011	Hazard Quotient [a)] 1998-2003	Status under 1107/2009
Methamidophos	0.29%		Not approved (2008)
Imazalil	0.29%		Approved
Oxamyl	0.26%		Approved
Oxydemeton-methyl (sum)	0.25%		Not approved

[a)] Consumer group "All" (4-75 years)

Table 17 shows the 20 pesticides which had the highest HQ in the period 2004-2011. Some of the pesticides were also among the 20 pesticides that have the highest HQ in the period 1998-2003. For comparison the results from this period are also shown in the table. It is seen that the HQ for most of the non-approved substances is less in the present period, compared to the previous period. Dimethoate and omethoate are reported separately in this report, while they were reported as a sum in the previous report. Omethoate is not allowed to be used in the EU, but it is a metabolite of dimethoate, hence the relatively high HQ of omethoate is most likely due to the use of dimethoate. A large contribution from an eventual misuse of omethoate is not likely, because it is difficult to acquire the substance. Most of the substances, which have been "not-approved", quite recently, still contribute to the average exposure for the period 2004-2011. However, it is expected that the HQ for these substances will decrease further in the future.

Conclusion for exposure

The average exposure to pesticides for the group "Adults" was calculated to be 146 µg/day/person, using Model 3 (non-detects assumed to be ½LOR, but limiting correction to 25 times the value from Model 1 (non-detects assumed to be zero)). This model takes into account both processing factors and that non-detects could have contents above zero. Women have the highest average exposure (151 µg/day/person), compared to men and children (134 µg/day/person and 98 µg/day/person, respectively), as they eat more fruit and vegetables.

Consumers (men and women) eating more than 550 g of fruit and vegetables per day have an intake that was higher than the average exposure, namely 261 µg/day/person compared to 134 µg/day/person for men and 240 µg/day/person compared to 151 µg/day/person for women. The relative increase in exposure was independent of the model chosen; for both Model 1 and Model 3, the exposure as well as Hazard Index increased 155-170% for women and 190-210% for men, compared to the values for the average diets.

The choice of domestic vs. foreign grown commodities has a significant influence on the exposure. For all groups ("Adults", "Men", "Women", "Children ", "High consumers" (male or female)), using either Model 1 or Model 3, the exposure as well as the Hazard Index was reduced to 45-55% of the mixed selection[1].

The risk assessment of the cumulative exposure was performed by the Hazard Index method. The Hazard Quotient was calculated for each pesticide and then summed into a so-called

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[1] *Exposure calculated using residue levels from domestic grown commodities for those commodities where domestic samples were analysed and residue levels for foreign samples otherwise vs. domestic and foreign grown commodities selected with the same distribution as the distribution of the analysed samples.*

Hazard Index, (HI). The HQs for the individual pesticides range from 0.00001% to 2.4% with most of the HQs (98%) being below 1% (see Appendix 7.9) indicating that there is no risk of adverse effects following exposure to the individual pesticides. The HI for the group “Adults” was 18% with the chosen model. The HI was highest for children (44%), compared to women (20%) and men (14%). For consumers (men and women) eating more than 550 g fruit and vegetable per day, the HI increased from 14% to 29% for men, while for women the HI increased from 20% to 33%. The HI of 18% for adults and 44% for children is not considered to indicate a risk of adverse effects following a cumulative exposure to all the detected pesticides. The HI method assumes the same kind of adverse effect for all the detected pesticides and therefore it is a relatively conservative (precautionary) approach for cumulative risk assessment but the method was used here to give an indication of whether there is a risk with the cumulative exposure or not. Furthermore the method gives some indications of the commodities and pesticides that contribute most to the risk.

About 95% of the HI or exposure was accounted for by 25 different commodities. Regarding pesticides, the exposure and HI are distributed between many substances.

Summarising the results of the exposure and the HI it can be concluded that according to our present knowledge there is no reason to be concerned about pesticide exposure for the Danish population even for consumers (adults) who eat more than 550 g of fruit and vegetables each day.

On the other hand, the exposure to pesticide residues from the food should not be ignored and the basis for exposure calculations for the Danish consumers should be further improved by:

1) Expanding the number of pesticides in the monitoring programme.

2) Increasing the sensitivity of the analytical methods in order to minimize the numbers of samples with undetected residues.

3) Providing detailed dietary information for more commodities.

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6 Annexes

6.1 Exposure calculations

Exposure to pesticide residues from food has been calculated from an estimate of the average content in foods of pesticides included in the monitoring programmes, combined with the estimated average consumption of Danish consumer groups.

As previously explained, most pesticides and all significant food items in the monitoring programmes have been included all eight years (2004-2011). All pesticides included in the monitoring programmes were used in the exposure calculations, but the available data for recently included pesticides do not cover all eight years.

The monitoring programmes primarily include fresh fruit and vegetables and cereals. For some commodities, a smaller part of the samples were sampled as frozen food. Results from these samples have been included in the results for fresh items.

In general, samples were analysed with their peels (conforming to the definitions of maximum residue levels), thus the measured content might include parts that are not normally consumed. In a few important cases, corrections have been made for the reduction of pesticide contents due to peeling. However, no other corrections have been made for the reduction of residues that may happen during preparation of the food.

Calculation of the average content of pesticides

Data have been extracted from the LIMS of the Danish Veterinary and Food Administration and transformed to the EFSA Standard Sample Description (Andersen, 2011), expanding the data on detected residues to include full information on the analytical profile for each sample, including the actual reporting limit (which may vary between the different years) for non-detected pesticides.

An average content has been calculated for each combination of pesticide, food item and origin.

Origin: As previously shown, the residue levels sometimes differ considerably between countries. Therefore calculations were performed separately for the two groups: Domestic or foreign origin.

Non-detected residues: Even though a pesticide has been used, not all pesticides residues are detected in all samples. Due to technical and economical limitations in the monitoring programme, some samples will contain residues not detected by the analytical procedures, either because the pesticides were not included in the programme or because the residue content was lower than the reporting limit used.

Due to the low detection frequency of most pesticides, it is difficult to set up a model for handling of left censored data (EFSA, 2010). Three different models have been used:

Model 1:

Content of pesticides not detected have been assumed 0 (zero).

In this model, the calculated results might be underestimated, since non-detected residues are ignored.

Model 2:

If a pesticide has not been detected in a commodity/origin combination, the average content of the pesticide is assumed to be 0 (zero) in that commodity/origin combination.

If a pesticide has been detected in a commodity/origin combination, content of pesticides not detected in a sample of that commodity/origin combination have been assumed to be 50% of the limit of detection (LOR).

In this model, the average content is over-estimated; because of sometimes very small frequencies of detection, the contribution from the 50% LOR-correction can be very high (in extreme cases up to nearly 3000 times more than the result using Model 0).

Model 3:

The average content is calculated in the same way as in Model 2. But the result from the 50%LOR-correction is limited to 25 times the result that has been calculated using Model 1. In this model extreme corrections from the 50% LOR-contribution are prevented. The background for this model is discussed in Annex6.2.

Processing factors: Detailed information on the actual processing performed by consumers as well as the effect on the residue levels is limited. On the other hand, intake from citrus fruits, bananas and melons contributes significantly to the total exposure of pesticides. As these food items mostly are consumed after peeling, corrections have been made for this process. Data has shown that approximately 90% of residues in these food items are found in the peel, and only 10% remains in the edible part – except for thiabendazole and pesticides from the benomyl group (carbendazim, thiophanat-methyl and benomyl), where about 25% remains in the edible parts (Appendix 7.6).

Calculation of consumption data

Consumption data have been provided by the Department of Nutrition at the Food Institute. The data used in the exposure calculations can be found in Appendix 7.4.

The data was collected as a part of DANSDA (DAnish National Survey of Diet and physical Activity) in 2005-2008 and is a subset of the data reported in “Danskernes kostvaner 2003-08” (Pedersen et al. 2010). The subset was chosen as it matches the period for chemical analysis best and as it is the most recently reported dataset. The dataset covers exposure of food and beverages recorded for 7 consecutive days collected from a representative sample of 2700 Danish consumers aged 4 to 75 years. The individuals are drawn as simple random sample from the civil population registration system. DANSDA uses a 7 day pre-coded (semi-closed) food diary with answering categories for the most commonly consumed foods and dishes in the Danish diet. The questionnaire is organized according to the typical daily meal pattern. For food items not found in the pre-coded categories it is possible to note type and amount eaten. The amounts of food eaten were given in household measures and estimated from photos of different portion sizes. The information collected represents information about the current dietary exposure in the population. The Danish National Centre for Social Research carried out an interview and the instruction in registration of the dietary exposure.

In this report the exposure is calculated in µg/kg bw/day and then recalculated to µg/day. In the previous report the exposure was only calculated in µg/day.

For each participant consumption and body weight was combined giving the consumption in g/kg bw/day (or mg/kg bw/day). For food the means was then calculated for the relevant consumer group, e.g. children 4-6 years of age.

To give the exposure in µg/person/day the exposure in µg/kg bw/day has been multiplied with the mean bodyweight of the relevant consumer group. Because of rounding of the figures multiplying an exposure in µg/kg bw/day in Section 4.3 with a mean bodyweight will not necessarily give the value indicated in µg/day. It was shown that calculating in this way only give a reasonable result if the bodyweights do not differs considerable within the consumer group. Because of this the exposure has not be calculated for the consumer group "All" (4-75 years) but for "Adults" instead of.

It should be noted that consumption data are not available on raw commodities but on food as eaten, e.g. oranges without peel or prepared food, e.g. bread-roll. Consumption data has been included in the calculations as if they were given for raw commodities. If consumption data were available for both fresh and frozen food and there was residue data for the raw commodity, the consumptions for the two foods were added. The same has been the case for some commodities where consumptions were given for raw and canned but only residues in the raw commodity were analysed, e.g. raw and canned cherries. This have be done to include as many consumption data as possible.

Not all foods included in the dietary survey were included in the exposure calculations since they were not analysed in the monitoring programme. On the other hand not all food analysed were included in the dietary survey. If residue data were available a low consumption of 0.01 g/day was applied, radish and pomelos (see Appendix 7.4).

For bread consumption data have been recalculated to flour. In the dietary survey many data are available for bread, cakes etc. while in the monitoring programme kernels and flour have been analysed. For calculating the consumption for bread to consumption of flour a factor 0.5 and 0.7 was used for wheat while for rye a factor of 0.6 was.

Calculation of exposure

The contribution to exposure of pesticide residues for each combination of pesticide and food item and origin was calculated from the average content of that pesticide and the estimated average consumption of that food item within the target consumer group.

For each group of consumers, the individual contributions to exposure have been summed for food items, pesticides and origin.

Since the food surveys did not include information of the origin of the foods eaten, two models for the origin of food items have been used:

a. The origins of food items consumed have the same distribution between domestic and foreign produce as the distribution between the samples analysed.
b. As the previous model, except that the domestic produce is consumed whenever available (i.e. has been sampled in the monitoring programmes)

Effects of models and analysis of robustness

Calculated results for the exposure to pesticides are subject to some uncertainty partly caused by differences between the real world and the calculating models used, and partly because the data used in the modelling is sampled with some statistical uncertainty.

While the uncertainty of the residue contents in the single samples is well described, as determinations were performed by accredited methods (normally an analytical reproducibility standard deviation of 15-25% would be expected), the bias of the average content is not known due to the unknown contribution of non-detected residues and the origin of the food in the diet.

Average content: Calculations with different models for the compensation of non-non-detected residues reveals that differences can be quite high for some pesticides, while in other cases the compensation seems very reasonable.

The organically grown foods items have been excluded from calculations of exposure, as the consumption of the two types are expected to be very unevenly distributed between consumers. In some studies, no differentiation between organically grown and conventionally grown food items is made when calculating the exposure (EFSA, 2011). In the previous report on pesticide residues 1998-2003 (Poulsen et al., 2004) it was found that including the organically samples (4% of total samples) would reduce the exposure by approx. 6%. In the present report, organically grown samples (6% of total samples) are excluded from exposure calculations.

Consumption: The distribution of residues between samples of different origin could be expected to vary according to the pattern of pesticides used under different growing conditions and legislation. This expectation seems to be confirmed by the present study.

As previously mentioned, the food consumption study did not provide information on the origin of the consumed food. The sample plans from the monitoring programmes normally target samples to the expected distribution between consumption of domestic and foreign grown items, but the actual distribution might differ from this estimate.

In models that include corrections for non-detected residues (Model 2 and 3), samples have been separated in two groups for the correction: Domestically vs. foreign grown. Since the foreign grown samples may include samples from different countries using different types of pesticides, the algorithm used for corrections overestimate the contribution from non-detected residues in the foreign grown samples compared to the domestically grown. When comparing results for Danish vs. foreign grown samples, results for the relative difference calculated by Model 2 is 3-16% higher that results from Model 1.

Model used in the report

Unless otherwise stated, the following model has been used throughout the report:

Origin: The average content of pesticide residues (including compensation for non-detected residues) has been calculated separately for samples of domestic and foreign origin; origin of consumed food items is assumed to follow the same distribution between domestic and foreign samples as the distribution of samples in the monitoring programmes.

Non-detected residues: Results are calculated using Model 2, i.e. by compensating for non-detected residues using the ½LOR-model, but limiting the result to 25 times the result from Model 1 (which do not compensate for non-detected residues).

Processing factors: Corrections for the reduction of pesticide residues by peeling of citrus fruits, bananas and melons are included.

Organically grown samples are not included.

6.2 Correction for samples with non-detected residues

Comparing models

For children, using Model 2 (assuming that non-detected residues are 50% of the reporting limit) leads to a Hazard Index of 124%, i.e. above 100%, whereas using Model 1 (assuming that non-detected residues are zero) leads to a HI at 14% (not correcting for peeling in either case).

However, an examination of the details leading to these results shows clear indications of over-correction for non-detected residues using Model 2. Apples and pears contribute with 58% and 18% respectively. For apples, this is mainly caused by oxydemeton-methyl with an HQ of 35% (61% of HI for apples) based on one detected residue in 392 samples (correction factor[1]: 2305), high values for the limit of reporting during some of the years (2006-2008: 0.36 mg/kg) and a low ADI of 0.0003 mg/kg bw/d. Without this single detection, HI would have been calculated to 23%. For pears a single detected residue of oxydemeton-methyl in 300 samples (correction factor: 2869) contributes with HQ=13% (68% of HI for pears).

Oxydemeton-methyl was detected once in each of four commodities in apples, pears, exotic fruit (218 samples analysed) and pineapples (55 samples analysed). In each case the HQ from oxydemeton-methyl contributed with 61% - 83% of the HI of that commodity (correction factors: 300 –2900).

For bananas (HI, Model 2 (with reduction for peeling) for children: 0.21%), linuron contributes with 25% of that value (HQ: 0.053%, correction factor: 203, one detected residue in 343 samples) and carbaryl contributes with 9% (HQ: 0.019%, correction factor: 408, one detected residue in 425 samples). Thus, one detection each of linuron and carbaryl contributes with 34% of the HI.

For cucumbers (HI, Model 2 for children: 8.2%), aldrin/dieldrin (sum) contributes with 36% of that value (HQ: 3.0%, correction factor: 54, one detected residue in 218 samples) and dichlorvos contributes with 33% of that value (HQ: 2.7%, correction factor: 92, one detected residue in 182 samples). Thus, one detection each of dichlorvos and aldrin/dieldrin (sum) contributes with 69% of the HI.

These (and similar examples) have been the background for setting up Model 3 using a limiting factor 25 on corrections for non-detected residues.

Using Model 3 (without peeling) HI for children has been calculated to 56% (45% of Model 2) as the contribution from oxydemeton-methyl is reduced from 35.5% to 0.38%.

Using Model 3 for (peeled) bananas, HI is reduced to 0,049% (65% of Model 2), mainly because the contribution from linuron and carbaryl is reduced from 0.072% to 0.008%.

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[1] *Correcting factor: (Result using Model 2 (with ½LOR-corrections))/ (Result using Model1(without correction))*

Using Model 3 for cucumbers, HI is reduced to 4.2% (51% of Model 2), mainly because the contribution from linuron and carbaryl is reduced from 5.7% to 2.1%.

Limiting the correction

In the last multi-annual report on pesticide residues 1998-2003 (Poulsen et al., 2004), a limiting factor of 25 between the results calculated using Model 1 and Model 3 was used based on empirical evidence. Based on results from the present period, the same factor has been used in the present report.

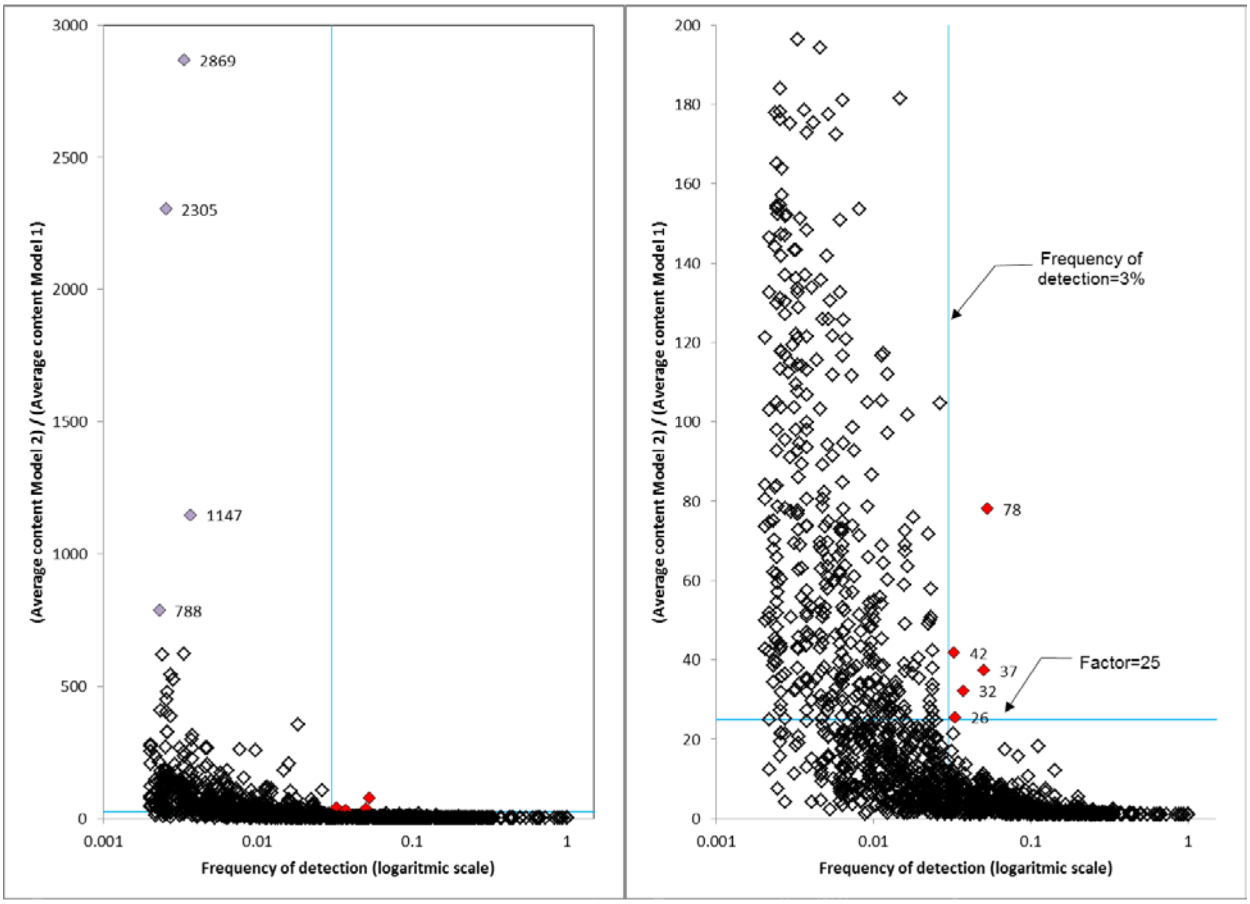

Figure 30. *Relative difference between average content calculated by Model 2 (non-detected residues assumed to be 50% of LOR) and Model 1 (non-detected residues assumed to be zero. Relative differences are shown using two different scales (0-3000 and 0-200, respectively) .*

(78): Phosalone in orange marmelade: 19 analysed, 1 detected (5.3%). Factor=78.1
(42): Carbaryl in apricots: 31 analysed, 1 detected (3.2%). Factor=41.9
(37): lambda-Cyhalothrin in currants: 20 analysed, 1 detected (5.0%). Factor=37.4
(32): lambda-Cyhalothrin in head cabbage: 54 analysed, 2 detected (3.7%). Factor=32.2
(26): Triadimefon (sum) in pomelos: 61 analysed, 2 detected (3.3%). Factor=25.5

(2869): Oxydemeton-methyl (sum) in pears: 300 analysed, 1 detected (0.3%). Factor=2869
(2305): Oxydemeton-methyl (sum) in apples: 392 analysed, 1 detected (0.3%). Factor=2305
(1147): Binapacryl in plums: 273 analysed, 1 detected (0.4%). Factor=1147
(788): Iprodione in lemons, lime: 432 analysed, 1 detected (0.2%). Factor=788

The relative difference between results using Model 2 (non-detected assumed to be 50% of LOR) and Model 1 (non-detected assumed to be zero) varies from close to 1 to up to nearly

3000 when looking at individual combinations of pesticide, commodity and origin (domestic or foreign) (**Figure 30**).

However, for combinations of pesticide, commodity and origin where the frequency of detection is higher than 3%, the relative difference is less than 25 for all but a few combinations.

7 Appendices

7.1 Commodity groups not included in exposure calculations

No residues were found in samples of animal origin[1], Therefore these samples have been excluded from exposure calculations.

Samples that have been cultivated by organic methods have not been included in exposure calculations. Although a few residues have been found, such samples would not contribute in any significant degree to the exposure of the general population. Also, estimation of their consumption would be uncertain.

Some commodity groups, not representing major parts of a normal diet, have been excluded when none or only a few residues have been found.

In some cases a commodity has been represented by analytical results from very few samples. In cases where the commodity does not represen major parts of a normal diet, these samples have been excluded from the exposure calculations.

The left side of the table below lists the excluded commodities. The number of samples (of Danish resp. foreign origin) analysed is listed together with the number of samples where residues were found (or not).

The right side of the table shows the pesticides that were found in the commodity in question, the number of samples of the commodity analysed for that pesticide and the number of samples where the pesticide was found. The range of reporting limits used are listed together with the average residue concentration in those samples where the pesticide was found.

The table lists the organically grown commodities followed by conventionally grown samples. Within each of these groups, fruit and vegetables, followed by cereals, products of animal origin and baby food are listed. Commodities are listed alphabetically within each group.

Commodity	**Origin of samples (DK=Domestic; F=Foreign)**	**Number of samples analysed**	**Without detected residues**	**With detected residues**	**Pesticide**	**Number of samples analysed**	**Number of samples with residues**	**General limit of quatifikation (mg/kg)**	**Avg. content (in samples with residues) (mg/kg)**
Organically grown samples									
Apples (organic)	DK	27	27						
Apples (organic)	F	40	40						
Avocados (organic)	F	5	5						
Bananas (organic)	F	32	31	1	Chlorpyrifos	32	1	0.008-0.01	0.019

[1] *Exposure to residues in samples of animal origin of pesticides from environmental sources have been reported in as part of Directive 96/23 and have not been included in the present report.*

Commodity	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	Without detected residues	With detected residues	Pesticide	Number of samples analysed	Number of samples with residues	General limit of quatifikation (mg/kg)	Avg. content (in samples with residues) (mg/kg)
Basil (organic)	DK	2	2						
Beans, kidney (organic)	F	10	9	1	Malathion (sum)	10	1	0.01	0.04
Beans, soy, dried (organic)	F	1	1						
Broccoli (organic)	DK	3	3						
Broccoli (organic)	F	2	2						
Carrots (organic)	DK	24	24						
Carrots (organic)	F	21	21						
Cauliflowers (organic)	F	1	1						
Chick pea (organic)	F	7	7						
Chives (organic)	F	1		1	Acetamiprid	1	1	0.01	0.028
Coffee beans, green (organic)	F	4	4						
Courgettes (organic)	F	1	1						
Cucumbers (organic)	DK	10	10						
Cucumbers (organic)	F	11	11						
Currants, black (organic)	F	1	1						
Currants, red (organic)	DK	1	1						
Ginger (organic)	F	1	1						
Hazelnuts (organic)	F	3	3						
Head cabbage, red (organic)	DK	2	2						
Head cabbage, red (organic)	F	1	1						
Head cabbage, spring (organic)	DK	2	2						
Head cabbage, spring (organic)	F	1	1						
Kiwi (organic)	F	22	21	1	Fenhexamid	22	1	0.01-0.012	0.1
Leek (organic)	DK	5	5						
Lemons (organic)	F	26	25	1	Chlorpyrifos	26	1	0.008-0.01	0.025
					Propargite	26	1	0.006-0.1	0.027
Lentils (organic)	F	10	10						
Lettuce (organic)	DK	18	18						
Lettuce (organic)	F	16	16						
Limes (organic)	F	6	5	1	Imazalil	6	1	0.01	0.036
Lingonberries (organic)	F	1	1						
Mandarins, clementines (organic)	F	9	9						
Melons (organic)	F	2	2						
Onions (organic)	DK	3	3						
Onions (organic)	F	6	6						
Oranges (organic)	F	31	30	1	Imazalil	30	1	0.01-0.05	0.13
Parsley (organic)	DK	3	2	1	Endosulfan (sum)	3	1	0.005	0.009
Peaches (organic)	F	1	1						
Pears (organic)	DK	6	6						
Pears (organic)	F	35	32	3	Carbendazim and benomyl	35	1	0.007-0.05	0.25
					Chlormequat	34	2	0.006-0.01	0.027
					Cyhalothrin, lambda-	35	1	0.002-0.05	0.007

Commodity	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	Without detected residues	With detected residues	Pesticide	Number of samples analysed	Number of samples with residues	General limit of quatifikation (mg/kg)	Avg. content (in samples with residues) (mg/kg)
					Phosmet (sum)	35	1	0.006-0.3	0.04
Peppers, sweet (organic)	DK	7	7						
Peppers, sweet (organic)	F	26	25	1	Pyrethrins	26	1	0.003-0.04	0.14
Persimmon (organic)	F	1	1						
Pineapples (organic)	F	8	8						
Plums (organic)	F	1	1						
Pomegranate (organic)	F	1	1						
Potatoes (organic)	DK	31	31						
Potatoes (organic)	F	12	11	1	DDT (sum)	12	1	0.008-0.05	0.012
Raspberries (organic)	F	2	2						
Ruccola (organic)	F	4	4						
Sage (organic)	DK	1	1						
Scarole (organic)	F	1	1						
Strawberries (organic)	DK	10	10						
Strawberries (organic)	F	7	7						
Sugar pea (organic)	F	1	1						
Sunflower seed (organic)	F	5	5						
Table grapes (organic)	F	31	30	1	Fenhexamid	29	1	0.01-0.012	0.03
Tea, fruit (organic)	F	1	1						
Tea, herbal (organic)	F	3	2	1	Carbendazim and benomyl	3	1	0.01	0.012
Teas (organic)	F	11	7	4	Bifenthrin	3	2	0.006	0.21
					Carbendazim and benomyl	11	1	0.01	0.13
					Clomazone	11	1	0.015	0.05
Tomatoes (organic)	DK	21	21						
Tomatoes (organic)	F	25	23	2	Azoxystrobin	25	1	0.004-0.04	0.008
					Chlorothalonil	25	1	0.006-0.08	0.009
					Pyrethrins	25	1	0.003-0.04	0.04
Witloof (organic)	DK	1	1						
SUM	DK	177	176	1			1		
SUM	F	448	428	20			24		
SUM	Total	625	604	21			25		
Cereals (organic)									
Barley (malting) (organic)	DK	1	1						
Barley grit (organic)	DK	4	4						
Barley grit (organic)	F	1	1						
Barley kernels (organic)	DK	4	4						
Barley kernels (organic)	F	5	5						
Millet (organic)	F	3	3						
Oat bran (organic)	DK	2	2						
Oat kernels (organic)	DK	13	13						
Oat kernels (organic)	F	7	7						
Rice flour (organic)	F	1	1						

Commodity	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	Without detected residues	With detected residues	Pesticide	Number of samples analysed	Number of samples with residues	General limit of quatifikation (mg/kg)	Avg. content (in samples with residues) (mg/kg)
Rice, brown (organic)	F	9	9						
Rice, white (organic)	F	27	27						
Rice, wild (organic)	F	2	2						
Rolled oat (organic)	DK	25	25						
Rolled oat (organic)	F	23	22	1	Chlormequat	23	1	0.01	0.11
Rye flour (organic)	DK	28	28						
Rye flour (organic)	F	11	11						
Rye flour, bolted (organic)	DK	1	1						
Rye kernels (organic)	DK	19	19						
Rye kernels (organic)	F	8	8						
Spelt (organic)	DK	11	11						
Spelt (organic)	F	6	5	1	Chlormequat	6	1	0.01	0.019
Spelt, flour (organic)	DK	5	5						
Spelt, flour (organic)	F	16	16						
Spelt, grain (organic)	DK	3	3						
Spelt, grain (organic)	F	1	1						
Wheat bran (organic)	F	2	2						
Wheat flour (organic)	DK	26	25	1	Chlormequat	26	1	0.01	0.013
Wheat flour (organic)	F	28	27	1	Chlormequat	28	1	0.01	0.016
Wheat germ (organic)	DK	1	1						
Wheat kernels (organic)	DK	22	22						
Wheat kernels (organic)	F	16	16						
SUM	DK	165	164	1			1		
SUM	F	166	163	3			3		
SUM	Total	331	327	4			4		
Animal products(organic)									
Pork meat (organic)	DK	1	1						
Cow milk, 1 - 2.9% fat (semi-skimmed milk) (organic)	DK	1	1						
Cow milk, raw (organic)	DK	4	4						
Honey (organic)	DK	1	1						
SUM	DK	7	7						
SUM	Total	7	7						
Other (organic)									
Marmelade, orange (organic)	F	1	1						
Oranges, juice (organic)	F	1	1						
Raisin (organic)	F	3	3						
Wine, red (organic)	F	4	4						
Pasta, dried (organic)	F	2	2						
Rice cake (puffed) (organic)	F	8	8						
SUM	F	19	19						
SUM	Total	19	19						
Baby food (organic)									

Commodity	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	Without detected residues	With detected residues	Pesticide	Number of samples analysed	Number of samples with residues	General limit of quatifikation (mg/kg)	Avg. content (in samples with residues) (mg/kg)
Babyfood, based on fruits and vegetables, canned (organic)	DK	3	3						
Babyfood, based on fruits and vegetables, canned (organic)	F	59	59						
Babyfood, cereal based, canned (organic)	F	1	1						
Babyfood, cereal based, powder (organic)	DK	6	6						
Babyfood, cereal based, powder (organic)	F	21	21						
SUM	DK	9	9						
SUM	F	81	81						
SUM	Total	90	90						
Fruit and vegetables (not organic)									
Bamboo shoots	F	1	1						
Banana leaves	F	1	1						
Brazil nuts	F	11	11						
Cashew nut	F	7	7						
Chestnuts	F	4	4						
Chinese cabbage	DK	9	9						
Chinese cabbage	F	13	13						
Chinese radish	DK	1		1	Trichloronat	1	1	0.005	0.014
Chinese radish	F	3	3						
Globe artichokes	F	2	1	1	Bitertanol	2	1	0.01	0.012
Jerusalem artichokes	DK	10	10						
Jerusalem artichokes	F	1	1						
Lucerne sprouts	DK	1	1						
Pak-choi	F	2		2	Fenvalerat, esfenvalerat, RR- and SS-	2	1	0.008	0.01
					Fenvalerat, esfenvalerat, RS- and SR-	2	1	0.005-0.008	0.005
					Iprodione	2	2	0.006	1.03
Pecans	F	4	4						
Pistachios	F	11	11						
Poppy seed	F	5	4	1	Chlormephos	5	1	0.006	0.07
Quince	F	2		2	Carbendazim and benomyl	2	2	0.007-0.01	0.02
					Chlorpyrifos	2	1	0.008-0.01	0.07
					Thiophanate-methyl	2	1	0.01-0.011	0.013
Salsify	F	3	2	1	Aldrin and Dieldrin	3	1	0.008	0.016
Swedes	DK	1	1						
Tea, herbal	F	1		1	Acetamiprid	1	1	0.01	0.034
					Buprofezin	1	1	0.01	0.014
					Carbendazim and benomyl	1	1	0.01	0.023

Commodity	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	Without detected residues	With detected residues	Pesticide	Number of samples analysed	Number of samples with residues	General limit of quatifikation (mg/kg)	Avg. content (in samples with residues) (mg/kg)
					Methomyl and Thiodicarb	1	1	0.01	0.011
Turnips	F	2	1	1	Cyhalothrin, lambda-	2	1	0.002-0.005	0.006
Water spinach	F	3	3						
Witloof	DK	2	1	1	Bromide ion	1	1	2.5	3.3
Witloof	F	3	1	2	Chlorthal-dimethyl	3	1	0.005	0.011
					Cyfluthrin (sum)	3	1	0.005	0.03
					Permethrin (sum)	3	1	0.005	0.015
Yams	F	1	1						
SUM	DK	24	22	2			2		
SUM	F	80	69	11			19		
SUM	Total	104	91	13			21		
Cereals (not organic)									
Barley (malting)	DK	1		1	Glyphosate	1	1	0.15	1.7
					Mepiquat	1	1	0.01	0.027
Millet	F	2	2						
Oat bran	DK	1	1						
Oat bran	F	1	1						
Rye flour, bolted	F	1	1						
SUM	DK	2	1	1			2		
SUM	F	4	4						
SUM	Total	6	5	1			2		
Animal products (not organic)									
Beef liver	DK	15	15						
Beef meat	DK	195	195						
Beef meat	F	196	196						
Chicken meat	DK	95	95						
Chicken meat	F	5	5						
Fat, deer (kidney fat)	DK	30	30						
Horse meat	DK	8	8						
Lambs meat	DK	25	25						
Lambs meat	F	146	146						
Pork meat	DK	1097	1097						
Pork meat	F	2	2						
Sheep meet	DK	5	5						
Sheep meet	F	4	4						
Veal meat	DK	119	119						
Duck meat, steak (air or oil)	F	5	5						
Cow milk	DK	1	1						
Cow milk	DK	4	4						
Cow milk, < 1% fat (skimmed milk)	DK	1	1						
Cow milk, raw	DK	11	11						

Commodity	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	Without detected residues	With detected residues	Pesticide	Number of samples analysed	Number of samples with residues	General limit of quatifikation (mg/kg)	Avg. content (in samples with residues) (mg/kg)
Honey	DK	125	125						
Honey, monofloral	DK	4	4						
SUM	DK	1735	1735						
SUM	F	358	358						
SUM	Total	2093	2093						
Other (not organic)									
Beans with pods, canned	F	1	1						
Cranberry, dried	F	3	3						
Juice, grapefruit	F	1		1	Orthophe-nylphenol	1	1	0.03	0.1
Juice, mixed fruit	F	13	13						
Kiwi purèe	F	1	1						
Lemonade	F	1	1						
Mangoes, candied	F	1	1						
Marmelade, lemon	F	1	1						
Marmelade, mixed citrus	F	2	2						
Nuts, mixed, roasted	F	3	3						
Oranges, juice, conc.	F	2	1	1	Carbendazim and benomyl	2	1	0.007	0.017
Corn flakes	F	1	1						
Rice cake (puffed)	F	6	6						
SUM	F	36	34	2					
SUM	Total	36	34	2					
Baby food (not organic)									
Babyfood, based on fruits and vegetables, canned	DK	2	2						
Babyfood, based on fruits and vegetables, canned	F	16	16						
Babyfood, based on fruits and vegetables, powder	F	2	2						
Babyfood, cereal based, powder	DK	26	26						
Babyfood, cereal based, powder	F	20	20						
SUM	DK	28	28						
SUM	F	38	38						
SUM	Total	66	66						
SUM	DK	2147	2142	5			6		
SUM	F	1230	1194	36			48		
SUM	Total	3377	3336	41			54		

7.2 Pesticides sought in fruit and vegetables resp. cereals in 2004 – 2011 and their frequency of detection in conventionally grown crops.

Pesticide	Fruit and vegetables			Cereals		
	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)
2,4-D (sum)	4936	61 (1.2%)	0.01-0.04	927	0 (0.0%)	0.15
2-Naphthoxyacetic acid	501	0 (0.0%)	0.096	927	0 (0.0%)	0.15
4-Chlorophenoxy acetic acid	4936	0 (0.0%)	0.023-0.085	927	0 (0.0%)	0.33
Acephate	12477	24 (0.2%)	0.005-0.01	1657	0 (0.0%)	0.009-0.06
Acetamiprid	4936	40 (0.8%)	0.01	927	0 (0.0%)	0.06
Aclonifen	12447	1 (0.0%)	0.007-0.025			
Acrinathrin	4936	0 (0.0%)	0.095	927	0 (0.0%)	0.04
Aldicarb (sum)	12477	12 (0.1%)	0.008-0.033	27	0 (0.0%)	0.008
Aldrin and Dieldrin	12447	2 (0.0%)	0.008-0.01	1659	0 (0.0%)	0.008
Atrazine	12482	5 (0.0%)	0.009-0.01	1659	0 (0.0%)	0.008
Azimsulfuron	3519	0 (0.0%)	0.01			
Azinphos-ethyl	12447	0 (0.0%)	0.014-0.1	1659	0 (0.0%)	0.008
Azinphos-methyl	12484	128 (1.0%)	0.005-0.114	1659	1 (0.1%)	0.008
Azoxystrobin	12447	309 (2.5%)	0.004-0.04	1659	2 (0.1%)	0.006-0.008
Benalaxyl (sum)	8141	3 (0.0%)	0.004			
Benfuracarb	7541	6 (0.1%)	0.009-0.01	320	0 (0.0%)	0.009-0.01
Bentazone (sum)	4936	0 (0.0%)	0.01	728	0 (0.0%)	0.03
Bifenthrin	12447	149 (1.2%)	0.005-0.006	1659	0 (0.0%)	0.008-0.05
Binapacryl	10347	1 (0.0%)	0.007-0.059	1659	0 (0.0%)	0.042-0.25
Biphenyl	10353	1 (0.0%)	0.009-7			
Bitertanol	12486	94 (0.8%)	0.006-0.01	1498	0 (0.0%)	0.008
Bromide ion	37	11 (29.7%)	2.5	15	3 (20.0%)	2.5-5
Bromophos	12447	0 (0.0%)	0.005-0.05	1498	0 (0.0%)	0.008-0.083
Bromophos-ethyl	12447	0 (0.0%)	0.01	1659	0 (0.0%)	0.008
Bromopropylate	12447	44 (0.4%)	0.008-0.025	1659	0 (0.0%)	0.042-0.08
Bromoxynil	4936	0 (0.0%)	0.01-0.018	927	0 (0.0%)	0.04
Bromuconazole (sum)	2100	0 (0.0%)	0.01			
Bupirimate	12487	23 (0.2%)	0.01-0.05	1659	0 (0.0%)	0.008
Buprofezin	12489	18 (0.1%)	0.008-0.01	927	1 (0.1%)	0.03
Captafol	10347	1 (0.0%)	0.004-0.5	1659	0 (0.0%)	0.042-0.42
Captan	8030	6 (0.1%)	0.004-0.3	1659	0 (0.0%)	0.008-0.25
Captan/Folpet (sum)	2317	34 (1.5%)	0.006-0.3			
Carbaryl	11978	78 (0.7%)	0.006-0.05	954	0 (0.0%)	0.006-0.33
Carbendazim and benomyl	12474	700 (5.6%)	0.006-0.05	954	1 (0.1%)	0.007-0.07
Carbofuran (sum)	12447	9 (0.1%)	0.006-0.03	1659	0 (0.0%)	0.008-0.042
Carbophenothion	12447	0 (0.0%)	0.01-0.3	1659	0 (0.0%)	0.008-0.5
Carbosulfan	12482	2 (0.0%)	0.008-0.05	1659	2 (0.1%)	0.008-0.083
Carboxin	2100	0 (0.0%)	0.01			
Chinomethionat	1338	0 (0.0%)	0.006			
Chlordane (sum)				1659	0 (0.0%)	0.008
Chlorfenson	12447	0 (0.0%)	0.01-0.05	1659	0 (0.0%)	0.008
Chlorfenvinphos	12447	13 (0.1%)	0.005-0.03	1659	0 (0.0%)	0.008-0.042

Pesticide	Fruit and vegetables			Cereals		
	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)
Chlormephos	10347	1 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008
Chlormequat	1836	139 (7.6%)	0.006-0.1	1764	337 (19.1%)	0.0027-0.01
Chlorobenzilate	12447	0 (0.0%)	0.006-0.01	1659	0 (0.0%)	0.008-0.4
Chloropropylate	12447	0 (0.0%)	0.008-0.01	1659	0 (0.0%)	0.008-0.042
Chlorothalonil	12447	76 (0.6%)	0.006-0.08	1659	0 (0.0%)	0.008-0.042
Chlorpropham	546	11 (2.0%)	0.002-0.03			
Chlorpropham (sum)	11901	7 (0.1%)	0.002-0.03	1659	0 (0.0%)	0.008-0.042
Chlorpyrifos	12447	1162 (9.3%)	0.007-0.01	1659	4 (0.2%)	0.01-0.042
Chlorpyrifos-methyl	12447	58 (0.5%)	0.005-0.007	1659	10 (0.6%)	0.01-0.042
Chlorthal-dimethyl	8141	3 (0.0%)	0.005-0.006			
Cinidon-ethyl (sum)	3519	0 (0.0%)	0.01			
Clethodim	4936	0 (0.0%)	0.01	927	0 (0.0%)	0.11
Clodinafop-Propargyl	3519	0 (0.0%)	0.02			
Clofentezine	7825	5 (0.1%)	0.023-0.06			
Clomazone	4936	1 (0.0%)	0.01-0.015	927	0 (0.0%)	0.05
Cyfluthrin (sum)	12447	9 (0.1%)	0.005-0.05	1659	0 (0.0%)	0.008
Cyhalothrin, lambda-	12447	180 (1.4%)	0.002-0.05			
Cypermethrin (sum)	12447	235 (1.9%)	0.002-0.009	1659	0 (0.0%)	0.008
Cyproconazole	2100	0 (0.0%)	0.005			
Cyprodinil	12447	403 (3.2%)	0.004-0.01			
Cyromazine	4936	17 (0.3%)	0.026-0.2	927	0 (0.0%)	0.14
DDT (sum)	12447	6 (0.0%)	0.007-0.05	1659	0 (0.0%)	0.008
Deltamethrin	12447	80 (0.6%)	0.005-0.008	1659	28 (1.7%)	0.007-0.008
Demeton-S-Methyl	12487	0 (0.0%)	0.002-0.3	927	0 (0.0%)	0.33
Dialifos	12447	0 (0.0%)	0.005-0.05			
Diazinon	12447	39 (0.3%)	0.005-0.03	1659	0 (0.0%)	0.008
Dichlofenthion	8141	0 (0.0%)	0.004-0.025			
Dichlofluanid	12447	2 (0.0%)	0.005-0.06	1659	0 (0.0%)	0.008-0.05
Dichlorprop	4936	2 (0.0%)	0.01-0.025	927	0 (0.0%)	0.05
Dichlorvos	10347	1 (0.0%)	0.006	1498	0 (0.0%)	0.008
Dicloran	12447	8 (0.1%)	0.006-0.05	1659	0 (0.0%)	0.008
Dicofol (sum)	12447	193 (1.6%)	0.007-0.25	1498	0 (0.0%)	0.042-0.083
Diethofencarb	8181	4 (0.0%)	0.003-0.025	927	0 (0.0%)	0.05
Difenoconazole	12447	70 (0.6%)	0.004-0.03			
Diflufenican	12482	3 (0.0%)	0.004-0.03			
Dimethoate (sum)	12487	88 (0.7%)	0.007-0.01	927	2 (0.2%)	0.04
Dimethomorph	4936	47 (1.0%)	0.01	927	0 (0.0%)	0.1
Dimoxystrobin	3519	0 (0.0%)	0.01			
Diniconazole	2100	1 (0.0%)	0.01			
Dinoterb	4936	0 (0.0%)	0.01	927	0 (0.0%)	0.07
Dioxathion	12447	0 (0.0%)	0.005-0.025	1659	0 (0.0%)	0.008-0.042
Diphenylamine	12447	112 (0.9%)	0.005-0.006	1659	0 (0.0%)	0.008
Ditalimfos	12447	0 (0.0%)	0.008-0.03	1366	0 (0.0%)	0.008
Dithiocarbamates	7902	460 (5.8%)	0.1			
DNOC	4936	0 (0.0%)	0.01-0.046	927	0 (0.0%)	0.08
Endosulfan (sum)	12447	110 (0.9%)	0.005-0.008	1659	0 (0.0%)	0.008
Endrin	12447	0 (0.0%)	0.005-0.05	1659	0 (0.0%)	0.008
Epoxiconazole	4936	2 (0.0%)	0.01-0.016	927	0 (0.0%)	0.02
Ethiofencarb	10461	0 (0.0%)	0.007-0.01	954	0 (0.0%)	0.007-0.03
Ethion	12447	9 (0.1%)	0.005-0.03	1659	0 (0.0%)	0.008-0.05

Pesticide	Fruit and vegetables			Cereals		
	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)
Ethoxyquin	7628	1 (0.0%)	0.05-0.25			
Etrimfos	12447	0 (0.0%)	0.008-0.01	1659	0 (0.0%)	0.008-0.042
Famoxadone	3519	10 (0.3%)	0.01			
Fenamiphos (sum)	1555	0 (0.0%)	0.005			
Fenarimol	12447	15 (0.1%)	0.005-0.03	1659	0 (0.0%)	0.008-0.8
Fenazaquin	4936	6 (0.1%)	0.01	927	0 (0.0%)	0.02
Fenbuconazole	2100	2 (0.1%)	0.01			
Fenchlorphos (sum)	12447	0 (0.0%)	0.008-0.01	1659	0 (0.0%)	0.008-0.042
Fenhexamid	10461	399 (3.8%)	0.01-0.012	27	0 (0.0%)	0.012
Fenitrothion	12447	28 (0.2%)	0.005-0.04	1659	0 (0.0%)	0.008-0.042
Fenoxaprop-P-Ethyl	12490	1 (0.0%)	0.005-0.04			
Fenpropathrin	12447	5 (0.0%)	0.005-0.06	1659	0 (0.0%)	0.083-0.4
Fenpropidin	12482	0 (0.0%)	0.005-0.06			
Fenpropimorph	12447	6 (0.0%)	0.005-0.03			
Fenson	12447	1 (0.0%)	0.01-0.05	1659	0 (0.0%)	0.008
Fenthion (sum)	12482	40 (0.3%)	0.006-0.05	1498	0 (0.0%)	0.008
Fenvalerat, esfenvalerat, RR- and SS-	12447	14 (0.1%)	0.008-0.05	1659	0 (0.0%)	0.04
Fenvalerat, esfenvalerat, RS- and SR-	12447	9 (0.1%)	0.005-0.05	1659	0 (0.0%)	0.008
Fluazifop-P-butyl (sum)	4936	0 (0.0%)	0.01	927	0 (0.0%)	0.14
Flucythrinate	12447	2 (0.0%)	0.004-0.01			
Flucythrinate (sum)				1659	0 (0.0%)	0.008
Fludioxonil	12447	250 (2.0%)	0.005-0.06			
Flufenacet (sum)	3519	0 (0.0%)	0.01			
Fluoxastrobin	4936	2 (0.0%)	0.01			
Flupyrsulfuron-methyl	4936	0 (0.0%)	0.01-0.04			
Fluquinconazole	2100	0 (0.0%)	0.04			
Fluroxypyr (sum)	4936	2 (0.0%)	0.018-0.026			
Flurtamone	2100	0 (0.0%)	0.005			
Flusilazole	9775	5 (0.1%)	0.005-0.017			
Flutolanil	8141	0 (0.0%)	0.02-0.051			
Flutriafol	2100	11 (0.5%)	0.005			
Fluvalinate, tau-	4306	5 (0.1%)	0.01			
Folpet	8030	0 (0.0%)	0.005-0.044	1659	0 (0.0%)	0.008
Fonofos	8141	0 (0.0%)	0.01-0.048			
Formothion	11109	0 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008-0.083
Fuberidazole	2100	0 (0.0%)	0.005			
Furathiocarb	12447	0 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008-0.083
Glyphosate	49	6 (12.2%)	0.15	1375	21 (1.5%)	0.07-0.83
HCH (sum)	12447	2 (0.0%)	0.008-0.05	1659	0 (0.0%)	0.008
Heptachlor (sum)	12447	0 (0.0%)	0.005-0.025	1498	0 (0.0%)	0.008
Heptenophos	12482	0 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008-0.083
Hexachlorobenzene	12447	4 (0.0%)	0.007-0.01	1659	0 (0.0%)	0.008
Hexaconazole	9751	8 (0.1%)	0.005-0.01			
Hexythiazox	4936	17 (0.3%)	0.01	927	0 (0.0%)	0.06
Imazalil	12146	1993 (16.4%)	0.01-0.05	954	0 (0.0%)	0.011-0.04
Iodosulfuron-methyl	4936	0 (0.0%)	0.01-0.04			
Iprodione	12447	442 (3.6%)	0.006-0.1	1659	1 (0.1%)	0.008
Iprovalicarb	4936	10 (0.2%)	0.01			
Isofenphos	12447	0 (0.0%)	0.01-0.06	1659	0 (0.0%)	0.042-0.083

Pesticide	Fruit and vegetables			Cereals		
	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)
Isofenphos-Methyl	8141	0 (0.0%)	0.005-0.006			
Isoproturon	4936	0 (0.0%)	0.01	927	0 (0.0%)	0.008-0.03
Jodfenphos	12447	0 (0.0%)	0.006-0.025	1498	0 (0.0%)	0.008
Kresoxim-methyl	12447	43 (0.3%)	0.005-0.007	1659	0 (0.0%)	0.008
Lindane	12447	1 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008
Linuron	10434	72 (0.7%)	0.01-0.04	27	0 (0.0%)	0.012
Malathion (sum)	12487	179 (1.4%)	0.008-0.01	1659	39 (2.4%)	0.008-0.08
Mecarbam	12482	0 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008-0.083
Mecoprop (sum)	4936	1 (0.0%)	0.01-0.022	927	0 (0.0%)	0.04
Mepiquat	1353	4 (0.3%)	0.01	1764	21 (1.2%)	0.01
Metalaxyl (sum)	12487	89 (0.7%)	0.005-0.03	1630	0 (0.0%)	0.008-0.05
Methacrifos	10812	1 (0.0%)	0.005-0.074	293	0 (0.0%)	0.1
Methamidophos	12477	23 (0.2%)	0.006-0.01	954	0 (0.0%)	0.008-0.08
Methidathion	12447	96 (0.8%)	0.01-0.3	293	0 (0.0%)	0.5
Methiocarb (sum)	10461	11 (0.1%)	0.01-0.011	755	0 (0.0%)	0.011-0.04
Methomyl and Thiodicarb	10461	86 (0.8%)	0.01	954	0 (0.0%)	0.01-0.04
Methoxychlor	12447	0 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008
Metribuzin	3519	0 (0.0%)	0.01			
Mevinphos	12482	1 (0.0%)	0.005-0.01	1498	0 (0.0%)	0.008
Molinate	8141	0 (0.0%)	0.02-0.082			
Monocrotophos	12488	1 (0.0%)	0.006-0.05	1659	0 (0.0%)	0.008-0.083
Monolinuron	4936	0 (0.0%)	0.01-0.2	927	0 (0.0%)	0.08
Myclobutanil	12447	130 (1.0%)	0.006-0.025	1659	0 (0.0%)	0.008-0.083
Nitrofen	9751	0 (0.0%)	0.004-0.005			
Nuarimol	12487	0 (0.0%)	0.005-0.03	1659	0 (0.0%)	0.008
Ofurace	9791	0 (0.0%)	0.005-0.01	927	0 (0.0%)	0.13
Orthophenylphenol	12447	557 (4.5%)	0.005-0.03			
Oxadixyl	8179	0 (0.0%)	0.01-0.04	954	0 (0.0%)	0.04
Oxamyl	10461	12 (0.1%)	0.01	27	0 (0.0%)	0.01
Oxycarboxin	9791	0 (0.0%)	0.006-0.01	927	0 (0.0%)	0.12
Oxydemeton-methyl (sum)	12435	4 (0.0%)	0.008-0.36	927	0 (0.0%)	0.04-0.05
Paclobutrazol	2100	0 (0.0%)	0.01			
Parathion	12447	0 (0.0%)	0.005-0.06	1659	0 (0.0%)	0.008-0.042
Parathion-methyl (sum)	12447	12 (0.1%)	0.007-0.06	1659	0 (0.0%)	0.008-0.042
Penconazole	12447	34 (0.3%)	0.007-0.01	1659	0 (0.0%)	0.008-0.042
Pendimethalin	8181	3 (0.0%)	0.005-0.017	927	0 (0.0%)	0.06
Pentachloroanisole	12447	0 (0.0%)	0.008-0.01			
Pentachlorobenzene	10347	1 (0.0%)	0.005-0.007			
Pentachlorophenol	12447	1 (0.0%)	0.006-0.1	1659	0 (0.0%)	0.008-0.4
Pentachlorothioanisole	12447	0 (0.0%)	0.005-0.05			
Permethrin (sum)	12447	17 (0.1%)	0.005-0.006	1659	2 (0.1%)	0.008
Phenkapton	10347	0 (0.0%)	0.009	1659	0 (0.0%)	0.008
Phenthoate	12447	2 (0.0%)	0.009-0.01	1659	0 (0.0%)	0.008-0.042
Phorate (sum)	12484	4 (0.0%)	0.008-0.046			
Phosalone	12447	36 (0.3%)	0.01-0.06	1659	0 (0.0%)	0.042-0.08
Phosmet (sum)	12447	29 (0.2%)	0.006-0.3	1659	0 (0.0%)	0.008-0.5
Phosphamidon	12482	0 (0.0%)	0.006-0.253			
Phoxim	12482	0 (0.0%)	0.006-0.197	1498	0 (0.0%)	0.008-0.042
Picolinafen	4936	0 (0.0%)	0.01	927	0 (0.0%)	0.04
Picoxystrobin	3519	0 (0.0%)	0.01			

Pesticide	Fruit and vegetables				Cereals			
	Number of samples analysed	Number of samples with detected residues		Reporting limit (mg/kg)	Number of samples analysed	Number of samples with detected residues		Reporting limit (mg/kg)
Pirimicarb (sum)	12487	47	(0.4%)	0.0055-0.01	1659	0	(0.0%)	0.009
Pirimiphos-Ethyl	12447	0	(0.0%)	0.005-0.008	1659	0	(0.0%)	0.008-0.042
Pirimiphos-methyl	12447	26	(0.2%)	0.005-0.01	1659	86	(5.2%)	0.008-0.042
Prochloraz (sum)	12447	191	(1.5%)	0.004-0.06				
Procymidone	12447	152	(1.2%)	0.006-0.02	1659	0	(0.0%)	0.008
Profenofos	12447	24	(0.2%)	0.005-0.025	1659	0	(0.0%)	0.008-0.042
Propamocarb (sum)	4936	110	(2.2%)	0.01	927	0	(0.0%)	0.04
Propanil	2100	0	(0.0%)	0.01				
Propargite	12447	64	(0.5%)	0.006-0.3				
Propham	12447	0	(0.0%)	0.004-0.3	1659	0	(0.0%)	0.083-0.4
Propiconazole	12482	9	(0.1%)	0.01-0.05	1659	0	(0.0%)	0.008-0.083
Propoxur	10461	1	(0.0%)	0.007-0.01	954	0	(0.0%)	0.007-0.04
Propyzamide	12447	6	(0.0%)	0.007-0.03	1659	0	(0.0%)	0.008-0.042
Proquinazid	4936	0	(0.0%)	0.01	927	0	(0.0%)	0.02
Prothiofos	12447	9	(0.1%)	0.005-0.03	1659	0	(0.0%)	0.008
Pymetrozine	4936	13	(0.3%)	0.01	927	0	(0.0%)	0.06
Pyraclostrobin	4936	213	(4.3%)	0.01	927	0	(0.0%)	0.03
Pyrazophos	12487	0	(0.0%)	0.01	1659	0	(0.0%)	0.008-0.083
Pyrethrins	12447	2	(0.0%)	0.003-0.04				
Pyridaben	8181	18	(0.2%)	0.01-0.015	927	0	(0.0%)	0.04
Pyridaphenthion	9791	0	(0.0%)	0.002-0.01	927	0	(0.0%)	0.05
Pyridate (sum)	4435	1	(0.0%)	0.01	927	0	(0.0%)	0.13
Pyrimethanil	11963	190	(1.6%)	0.005-0.04				
Pyriproxyfen	4936	93	(1.9%)	0.01	927	0	(0.0%)	0.02
Quinalphos	12447	1	(0.0%)	0.005-0.03	1659	0	(0.0%)	0.008-0.042
Quinoxyfen	2100	1	(0.0%)	0.005				
Quintozene (sum)	12447	21	(0.2%)	0.006-0.03	1659	0	(0.0%)	0.008
Quizalofop	4936	3	(0.1%)	0.016-0.04				
Simazine	12482	0	(0.0%)	0.01-0.204	1659	0	(0.0%)	0.008-0.083
Spiroxamine	4936	11	(0.2%)	0.01	927	0	(0.0%)	0.03
Sulfotep	12447	0	(0.0%)	0.005-0.025	1659	0	(0.0%)	0.008-0.042
Tebuconazole	12447	178	(1.4%)	0.006-0.025	1659	1	(0.1%)	0.019-0.042
Tebufenozide	3519	3	(0.1%)	0.01				
Tebufenpyrad	8181	31	(0.4%)	0.009-0.011	927	0	(0.0%)	0.1
Tecnazene	12447	2	(0.0%)	0.007-0.06	1659	0	(0.0%)	0.008-0.08
TEPP	12482	0	(0.0%)	0.01-0.06	1659	0	(0.0%)	0.008-0.083
Tetrachlorvinphos	12482	1	(0.0%)	0.008-0.03	1659	0	(0.0%)	0.05-0.083
Tetraconazole	2100	2	(0.1%)	0.01				
Tetradifon	12447	13	(0.1%)	0.01-0.05	1659	0	(0.0%)	0.01-0.083
Tetrasul	12447	0	(0.0%)	0.007-0.01	1659	0	(0.0%)	0.008-0.05
Thiabendazole	12447	1036	(8.3%)	0.01-0.05	954	0	(0.0%)	0.015-0.05
Thifensulfuron-methyl					927	0	(0.0%)	0.14
Thiometon	12447	0	(0.0%)	0.01-0.3				
Thiophanate-methyl	10461	58	(0.6%)	0.01-0.011	27	0	(0.0%)	0.011
Tolclofos-methyl	12483	9	(0.1%)	0.006-0.019	1659	0	(0.0%)	0.008-0.083
Tolylfluanid (sum)	12447	172	(1.4%)	0.005-0.03	1659	0	(0.0%)	0.042
Triadimefon (sum)	12482	118	(0.9%)	0.005-0.044	1659	0	(0.0%)	0.008-0.083
Triallate	4936	2	(0.0%)	0.01-0.1				
Triasulfuron					927	0	(0.0%)	0.04-0.15
Triazophos	12482	6	(0.0%)	0.006-0.05	1659	0	(0.0%)	0.008-0.083

Pesticide	Fruit and vegetables			Cereals		
	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)	Number of samples analysed	Number of samples with detected residues	Reporting limit (mg/kg)
Trichlorfon	12482	3 (0.0%)	0.01-0.084			
Trichloronat	12447	1 (0.0%)	0.005-0.03	1659	0 (0.0%)	0.008-0.042
Trifloxystrobin	12447	87 (0.7%)	0.002-0.025	1659	0 (0.0%)	0.008-0.042
Triflumuron	4936	21 (0.4%)	0.01			
Trifluralin	2100	0 (0.0%)	0.01			
Triticonazole	2100	0 (0.0%)	0.01			
Vamidothion	12482	0 (0.0%)	0.003-0.05			
Vinclozolin (sum)	12447	81 (0.7%)	0.005-0.01	1659	0 (0.0%)	0.008-0.042

7.3 Pesticides included in the monitoring and commodities where residues were found.

The left side of the table lists all pesticides found during the monitoring programmes 2004 – 2011 with representative sampling. The number of samples (of Danish resp. foreign origin) analysed for each pesticide is listed together with the number of samples where residues of that pesticide were found (or not). The full list of pesticides searched for can be found in Annex 6.2.

The right side of the table shows the commodities where the pesticide in question was found, the number of samples of the commodity that was analysed for the pesticide and the number of samples where the pesticide was found.

Commodities are listed alphabetically. The list includes all (conventional or organic) commodity groups.

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
2,4-D (sum)	F	4516	4455	61	Grapefruit	155	19
					Lemons	158	10
					Limes	18	4
					Mandarins, clementines	160	8
					Okra (Lady's fingers)	5	1
					Oranges	173	16
					Peppers, sweet	170	1
					Pomelos	34	2
Acephate	F	11068	11044	24	Apples	393	1
					Apricots	31	1
					Beans with pods	305	4
					Cape gooseberry	2	1
					Chilli peppers	42	2
					Grapefruit	388	1
					Kiwi	363	1
					Leek	68	1
					Lentils	13	1
					Lettuce	208	3
					Limes	52	3
					Melons	311	1
					Plums	318	1
					Strawberries	265	1
					Tomatoes	250	1
					Watermelon	39	1
Acetamiprid	DK	1597	1594	3	Apples	69	2
					Lettuce	60	1
Acetamiprid	F	4516	4478	38	Apples	124	5

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Aubergines	32	2
					Chilli peppers	9	1
					Cucumbers	89	2
					Grapefruit	155	5
					Lemons	158	1
					Lettuce	96	4
					Nectarines	90	1
					Oranges	173	1
					Peaches	64	2
					Pears	123	1
					Peas with pods	26	1
					Peppers, sweet	170	4
					Tea, herbal	1	1
					Teas	16	3
					Tomatoes	91	2
					Gojiberries, dried	1	1
					Chives (organic)	1	1
Aclonifen	DK	3179	3178	1	Parsley Root	33	1
Aldicarb (sum)	F	9973	9961	12	Basil	11	1
					Carrots	158	1
					Ginger	28	4
					Grapefruit	388	1
					Mandarins, clementines	411	1
					Melons	311	1
					Nectarines	211	1
					Ruccola	12	1
					Table grapes	458	1
Aldrin and Dieldrin	F	11309	11307	2	Cucumbers	218	1
					Salsify	3	1
Atrazine	F	11072	11067	5	Lemons	381	2
					Mandarins, clementines	411	1
					Oranges	491	1
					Pomelos	61	1
Azinphos-methyl	DK	3840	3837	3	Strawberries	163	2
					Rye kernels	100	1
Azinphos-methyl	F	11074	10947	127	Apples	394	45
					Apricots	31	3
					Kiwi	363	1
					Mandarins, clementines	411	1
					Nectarines	212	22
					Peaches	158	12
					Pears	301	37
					Peas with pods	40	1
					Plums	319	3
					Spinach	163	1
					Blueberry, dried	1	1
Azoxystrobin	DK	3881	3803	78	Carrots	340	8

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Cucumbers	199	36
					Kale	9	3
					Lettuce	163	5
					Parsley Root	33	1
					Parsnips	51	1
					Peas without pods	10	1
					Radish	3	1
					Ruccola	8	1
					Spinach	81	4
					Strawberries	163	14
					Tomatoes	212	2
					Rolled oat	43	1
Azoxystrobin	F	10951	10718	233	Aubergines	87	1
					Bananas	425	28
					Beans with pods	305	23
					Carambola	103	6
					Carrots	158	9
					Celery	21	1
					Chilli peppers	42	2
					Cucumbers	218	17
					Grapefruit	388	3
					Guava	9	1
					Jambolan	2	2
					Lemon grass	16	1
					Lettuce	208	7
					Limes	52	1
					Mandarins, clementines	411	1
					Melons	311	9
					Oranges	491	5
					Papayas	89	1
					Parsnips	10	1
					Peas with pods	40	2
					Peas without pods	43	5
					Peppers, sweet	385	22
					Persimmon	108	1
					Raspberries	101	7
					Ruccola	12	1
					Spinach	163	1
					Spring onions	32	1
					Strawberries	266	19
					Table grapes	459	46
					Tomatoes	249	6
					Vegetables, unspecified	3	1
					Rolled oat	86	1
					Tomatoes (organic)	25	1
Benalaxyl (sum)	F	6478	6475	3	Lettuce	153	1
					Melons	232	2

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
Benfuracarb	F	6237	6231	6	Cucumbers	129	1
					Mandarins, clementines	251	1
					Nectarines	121	1
					Pears	178	1
					Peas without pods	39	1
					Teas	24	1
Bifenthrin	F	10951	10802	149	Apples	394	9
					Apricots	31	1
					Aubergines	87	1
					Bananas	425	41
					Beans with pods	305	5
					Blackberries	35	3
					Cherries	24	1
					Chilli peppers	42	2
					Cucumbers	218	2
					Garlics	82	1
					Lettuce	208	5
					Limes	52	2
					Melons	311	10
					Nectarines	212	1
					Papayas	89	8
					Peaches	158	3
					Pears	301	2
					Peppers, sweet	385	6
					Persimmon	108	5
					Plums	319	5
					Radish	8	1
					Raspberries	101	1
					Ruccola	12	3
					Spinach	163	1
					Strawberries	266	6
					Table grapes	459	10
					Tomatoes	249	12
					Teas (organic)	3	2
Binapacryl	F	9620	9619	1	Plums	273	1
Biphenyl	F	8145	8144	1	Apples	349	1
Bitertanol	DK	3747	3666	81	Apples	214	37
					Cherries	3	1
					Pears	165	40
					Plums	72	3
Bitertanol	F	10938	10925	13	Cucumbers	218	1
					Globe artichokes	2	1
					Nectarines	212	5
					Onions	68	1
					Peaches	158	2
					Tomatoes	250	3
Bromide ion	DK	23	21	2	Ruccola	1	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Witloof	1	1
Bromide ion	F	29	17	12	Spinach	14	9
					Rice, white	7	3
Bromopropylate	F	10951	10907	44	Apples	394	6
					Fruit, mixed	5	1
					Grapefruit	388	17
					Lemons	380	8
					Mandarins, clementines	411	2
					Oranges	491	3
					Pears	301	3
					Pomelos	61	1
					Table grapes	459	1
					Tomatoes	249	2
Bupirimate	F	11077	11054	23	Apples	393	1
					Chilli peppers	42	1
					Cucumbers	218	3
					Currants, black	17	1
					Gooseberries	7	3
					Melons	311	3
					Nectarines	212	3
					Peaches	158	1
					Peppers, sweet	385	2
					Strawberries	266	4
					Tomatoes	250	1
Buprofezin	F	10496	10477	19	Beans with pods	305	2
					Courgettes	63	1
					Grapefruit	388	4
					Kiwi	363	1
					Lemons	381	1
					Mandarins, clementines	411	2
					Oranges	491	2
					Pomelos	61	1
					Tea, herbal	1	1
					Teas	40	1
					Tomatoes	250	2
					Rice, short grained	94	1
Captafol	DK	3443	3442	1	Spinach	63	1
Captan	F	7679	7673	6	Apricots	29	1
					Lemons	314	1
					Passion fruits	36	1
					Table grapes	401	3
Captan/Folpet (sum)	DK	745	727	18	Apples	192	16
					Pears	135	2
Captan/Folpet (sum)	F	1583	1567	16	Apples	349	9
					Blackberries	33	1
					Currants, red	27	3
					Gooseberries	7	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Pears	256	1
					Raspberries	82	1
Carbaryl	DK	3497	3496	1	Mushroom (Agaricus bisporus)	41	1
Carbaryl	F	10015	9930	85	Apples	393	20
					Apricots	31	1
					Aubergines	87	1
					Bananas	425	1
					Celery	21	1
					Courgettes	63	1
					Grapefruit	283	6
					Kiwi	363	2
					Mandarins, clementines	303	1
					Onions	68	3
					Oranges	377	2
					Peaches	158	3
					Pears	301	10
					Pineapples	55	8
					Plums	319	1
					Rambutan	47	1
					Raspberries	101	1
					Sesame seed	19	2
					Shallots	12	1
					Strawberries	265	1
					Table grapes	458	10
					Blueberry, dried	1	1
					Wine, red	265	7
Carbendazim and benomyl	DK	3496	3492	4	Broccoli	21	1
					Onions	292	1
					Plums	72	1
					Spinach	81	1
Carbendazim and benomyl	F	10513	9727	786	Apples	393	81
					Apricots	33	9
					Aubergines	87	1
					Basil	11	1
					Beans with pods	305	19
					Cape gooseberry	2	1
					Carambola	103	25
					Carrots	159	1
					Celery	21	1
					Cherries	24	5
					Chilli peppers	42	8
					Coriander, leaves	9	2
					Courgettes	63	1
					Cucumbers	218	11
					Currants, black	17	7
					Currants, red	28	4
					Fruit, mixed	5	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
Carbendazin and benomyl	F				Gooseberries	7	3
					Grapefruit	388	25
					Guava	9	1
					Kiwi	363	1
					Lemons	381	57
					Lentils	13	1
					Lettuce	208	4
					Limes	52	11
					Litchi	8	1
					Mandarins, clementines	411	35
					Mango	58	5
					Melons	312	22
					Mixed berries	2	2
					Mushroom (Agaricus bisporus)	35	9
					Nectarines	210	23
					Okra (Lady's fingers)	15	1
					Onions	68	2
					Oranges	491	31
					Papayas	89	21
					Passion fruits	37	8
					Peaches	158	29
					Pears	301	85
					Peas with pods	40	6
					Peas without pods	43	1
					Peppers, sweet	385	7
					Pineapples	56	1
					Pitaya	19	6
					Plums	318	9
					Pomegranate	16	4
					Pomelos	61	3
					Quince	2	2
					Rambutan	47	18
					Raspberries	101	9
					Shallots	12	2
					Spinach	162	7
					Spring onions	32	1
					Strawberries	265	22
					Table grapes	458	22
					Tamarillo	20	5
					Tea, herbal	1	1
					Teas	40	1
					Tomatoes	250	8
					Vegetables, unspecified	3	1
					Watermelon	39	2
					Wheat kernels	83	1
					Apple, dried	1	1
					Gojiberries, dried	1	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Oranges, juice	44	3
					Oranges, juice, conc.	2	1
					Raisin	3	1
					Wine, red	265	80
					Wine, white	7	2
					Pears (organic)	35	1
					Tea, herbal (organic)	3	1
					Teas (organic)	11	1
Carbofuran (sum)	F	10951	10942	9	Beans with pods	305	1
					Chilli peppers	42	3
					Grapefruit	388	2
					Melons	311	1
					Oranges	491	2
Carbosulfan	DK	3810	3809	1	Rye flour	28	1
Carbosulfan	F	11072	11068	4	Chilli peppers	42	1
					Kiwi	363	1
					Rye flour	57	1
					Pasta	43	1
Chlorfenvinphos	DK	3881	3870	11	Carrots	340	11
Chlorfenvinphos	F	10951	10949	2	Carrots	158	2
Chlormephos	F	9262	9261	1	Poppy seed	5	1
Chlormequat	DK	1313	1149	164	Pears	165	50
					Oat kernels	10	4
					Rolled oat	71	2
					Rye flour	58	4
					Rye kernels	136	10
					Spelt	37	27
					Spelt, flour	19	8
					Wheat bran	2	2
					Wheat flour	137	19
					Wheat kernels	231	37
					Wheat flour (organic)	26	1
Chlormequat	F	2479	2160	319	Aubergines	35	1
					Cucumbers	113	1
					Mushroom (Agaricus bisporus)	19	7
					Pears	300	73
					Peppers, sweet	230	1
					Table grapes	89	4
					Oat kernels	20	1
					Rolled oat	113	42
					Rye flour	73	22
					Rye kernels	73	4
					Spelt	13	13
					Spelt, flour	22	18
					Spelt, grain	2	1
					Wheat bran	13	5
					Wheat flour	223	72

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Wheat kernels	185	42
					Pear, canned	9	4
					Pasta	42	1
					Pasta, dried	32	2
					Pears (organic)	34	2
					Rolled oat (organic)	23	1
					Spelt (organic)	6	1
					Wheat flour (organic)	28	1
Chlorothalonil	DK	3881	3880	1	Gooseberries	4	1
Chlorothalonil	F	10951	10876	75	Aubergines	87	4
					Carambola	103	1
					Celeriac	7	1
					Chilli peppers	42	1
					Courgettes	63	1
					Cucumbers	218	16
					Lettuce	208	1
					Melons	311	10
					Nectarines	212	5
					Passion fruits	38	4
					Peaches	158	6
					Peas with pods	40	2
					Strawberries	266	9
					Table grapes	459	1
					Tomatoes	249	11
					Watermelon	40	1
					Tomatoes (organic)	25	1
Chlorpropham	F	92	81	11	Potatoes, new	79	11
Chlorpropham (sum)	F	10859	10852	7	Apples	394	1
					Kiwi	363	2
					Mandarins, clementines	411	2
					Spinach	163	1
					Tomatoes	249	1
Chlorpyrifos	DK	5471	5468	3	Radish	3	3
Chlorpyrifos	F	11309	10138	1171	Apples	394	100
					Apricots	31	1
					Asian cabbage,(unspecific)	2	1
					Aspargus, green	38	2
					Bananas	425	39
					Beans with pods	305	3
					Broccoli	63	1
					Carambola	103	24
					Carrots	158	5
					Celery	21	2
					Chilli peppers	42	8
					Chives	6	1
					Coriander, leaves	9	1
					Currants, black	17	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Currants, red	28	1
					Ginger	28	1
					Grapefruit	388	145
					Herbs, unspecified	3	1
					Kiwano	1	1
					Kiwi	363	15
					Lemons	380	136
					Lettuce	208	1
					Mandarins, clementines	411	260
					Mango	58	1
					Mangosteens	12	2
					Melons	311	3
					Mineola	3	2
					Nectarines	212	24
					Onions	68	1
					Oranges	491	213
					Passion fruits	38	4
					Peaches	158	30
					Pears	301	20
					Peppers, sweet	385	3
					Persimmon	108	8
					Pineapples	55	1
					Plums	319	12
					Pomegranate	16	1
					Pomelos	61	14
					Quince	2	1
					Rambutan	47	1
					Raspberries	101	1
					Ruccola	12	1
					Sesame seed	18	1
					Spinach	163	3
					Spring onions	32	1
					Strawberries	266	5
					Table grapes	459	53
					Tomatoes	249	1
					Rice, white	167	3
					Wheat flour	184	1
					Marmelade, orange	19	8
					Bananas (organic)	32	1
					Lemons (organic)	26	1
Chlorpyrifos-methyl	DK	5471	5467	4	Spelt	30	1
					Spelt, flour	16	1
					Wheat flour	78	2
Chlorpyrifos-methyl	F	11309	11245	64	Apples	394	7
					Carrots	158	2
					Grapefruit	388	1
					Kiwi	363	3

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
					Lemons	380	3
					Mandarins, clementines	411	8
					Nectarines	212	6
					Oranges	491	7
					Peaches	158	5
					Peppers, sweet	385	4
					Strawberries	266	1
					Table grapes	459	11
					Rice, white	167	1
					Wheat flour	184	4
					Wheat kernels	143	1
Chlorthal-dimethyl	F	6478	6475	3	Lettuce	153	1
					Pears	202	1
					Witloof	3	1
Clofentezine	F	6235	6229	6	Strawberries	159	5
					Gojiberries, dried	1	1
Clomazone	F	4516	4515	1	Teas (organic)	11	1
Cyfluthrin (sum)	F	11309	11300	9	Apples	394	1
					Peas with pods	40	1
					Plums	319	1
					Ruccola	12	1
					Table grapes	459	3
					Tomatoes	249	1
					Witloof	3	1
Cyhalothrin, lambda-	DK	4739	4735	4	Currants, black	11	1
					Kale	9	1
					Savoy cabbage	6	2
Cyhalothrin, lambda-	F	10185	10008	177	Apples	394	11
					Apricots	31	1
					Beans with pods	305	8
					Blueberries	46	1
					Brussels sprouts	15	1
					Carambola	103	4
					Celery	21	4
					Cherries	24	2
					Currants, black	17	1
					Kale	2	1
					Lettuce	208	14
					Mandarins, clementines	411	14
					Mango	58	1
					Mangosteens	12	1
					Melons	311	9
					Nectarines	212	13
					Oranges	491	12
					Papayas	89	2
					Passion fruits	38	2
					Peaches	158	9

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Pears	301	4
					Peas with pods	40	2
					Peppers, sweet	385	4
					Persimmon	108	5
					Plums	319	1
					Pomegranate	16	1
					Rambutan	47	2
					Spinach	163	15
					Spring onions	32	2
					Strawberries	266	7
					Table grapes	459	17
					Tamarillo	20	1
					Tomatoes	249	2
					Turnips	2	1
					Gojiberries, dried	1	1
					Pears (organic)	35	1
Cypermethrin (sum)	DK	5471	5448	23	Apples	213	2
					Celery	11	1
					Currants, black	11	4
					Currants, red	9	1
					Kale	9	2
					Lettuce	163	2
					Onions	292	1
					Plums	72	3
					Ruccola	8	2
					Spinach	81	5
Cypermethrin (sum)	F	11309	11095	214	Apples	394	1
					Apricots	31	4
					Asian cabbage,(unspecific)	2	1
					Aubergines	87	4
					Bananas	425	1
					Basil	11	1
					Basil (Ocimum sanctum)	2	1
					Beans with pods	305	16
					Blueberries	46	2
					Broccoli	63	1
					Carambola	103	20
					Celery	21	1
					Cherries	24	4
					Chilli peppers	42	13
					Chives	6	1
					Coriander, leaves	9	1
					Courgettes	63	2
					Cucumbers	218	2
					Currants, black	17	2
					Gooseberries	7	1
					Grapefruit	388	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
					Guava	9	1
					Jambolan	2	1
					Lemons	380	3
					Lettuce	208	2
					Limes	52	2
					Mandarins, clementines	411	1
					Mango	58	1
					Melons	311	4
					Nectarines	212	6
					Okra (Lady's fingers)	15	3
					Oranges	491	5
					Passion fruits	38	12
					Peaches	158	5
					Pears	301	1
					Peas with pods	40	8
					Peppers, sweet	385	6
					Pitaya	19	6
					Plums	319	5
					Pomegranate	16	1
					Pomelos	61	5
					Potatoes, new	79	1
					Rambutan	47	20
					Raspberries	101	3
					Rhubarbs	8	1
					Sapota	2	1
					Spinach	163	5
					Spring onions	32	1
					Strawberries	266	1
					Table grapes	459	4
					Tamarillo	20	6
					Teas	24	3
					Tomatoes	249	7
					Vegetables, unspecified	3	1
					Apricot, dried	7	1
					Gojiberries, dried	1	1
Cyprodinil	DK	3027	3005	22	Carrots	340	1
					Strawberries	163	21
Cyprodinil	F	9827	9443	384	Apples	394	1
					Apricots	31	1
					Aubergines	87	7
					Bananas	425	1
					Beans with pods	305	34
					Blackberries	35	1
					Blueberries	46	5
					Cherries	24	1
					Chilli peppers	42	2
					Cucumbers	218	26

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
					Currants, red	28	3
					Fennel	11	1
					Kiwi	363	1
					Lemons	380	2
					Lettuce	208	18
					Melons	311	4
					Mixed berries	2	1
					Nectarines	212	12
					Oranges	491	1
					Peaches	158	4
					Pears	301	33
					Peppers, sweet	385	11
					Plums	319	6
					Raspberries	101	16
					Spinach	163	2
					Spring onions	32	3
					Strawberries	266	73
					Table grapes	459	79
					Tomatoes	249	32
					Wine, red	181	3
Cyromazine	F	4516	4499	17	Aubergines	32	2
					Celery	5	1
					Cucumbers	89	1
					Melons	139	9
					Peas with pods	26	1
					Tomatoes	91	3
DDT (sum)	F	11309	11303	6	Carrots	158	1
					Passion fruits	38	1
					Peppers, sweet	385	1
					Potatoes, new	79	1
					Spinach	163	1
					Potatoes (organic)	12	1
Deltamethrin	DK	5471	5469	2	Spelt	30	1
					Wheat flour	78	1
Deltamethrin	F	11309	11203	106	Apples	394	2
					Apricots	31	3
					Avocados	39	1
					Beans with pods	305	13
					Blackberries	35	1
					Carambola	103	1
					Cucumbers	218	1
					Currants, red	28	2
					Figs, fresh	13	1
					Lettuce	208	2
					Mangosteens	12	1
					Nectarines	212	1
					Oranges	491	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Peaches	158	1
					Peas with pods	40	2
					Peppers, sweet	385	9
					Ruccola	12	4
					Spinach	163	14
					Spring onions	32	1
					Strawberries	266	4
					Table grapes	459	3
					Teas	24	1
					Tomatoes	249	11
					Cornflour	8	1
					Maize	41	18
					Rice, white	167	4
					Rolled oat	86	1
					Wheat flour	184	1
					Wheat kernels	143	1
Diazinon	F	10951	10912	39	Apples	394	5
					Cherries	24	2
					Chilli peppers	42	1
					Grapefruit	388	10
					Kiwi	363	7
					Lemons	380	4
					Mandarins, clementines	411	3
					Melons	311	1
					Oranges	491	4
					Pears	301	1
					Pineapples	55	1
Dichlofluanid	F	10951	10949	2	Pears	301	1
					Raspberries	101	1
Dichlorprop	F	4516	4514	2	Bananas	157	1
					Oranges	173	1
Dichlorvos	F	9180	9179	1	Cucumbers	182	1
Dicloran	F	11309	11301	8	Carrots	158	3
					Lettuce	208	2
					Peaches	158	1
					Pears	301	1
					Table grapes	459	1
Dicofol (sum)	F	10814	10620	194	Basil	11	1
					Beans with pods	305	1
					Chilli peppers	42	5
					Grapefruit	388	4
					Lemons	380	68
					Lettuce	208	1
					Mandarins, clementines	411	55
					Melons	311	6
					Nectarines	212	1
					Oranges	491	31

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Peas without pods	43	1
					Plums	319	2
					Pomelos	61	6
					Table grapes	459	3
					Teas	24	4
					Tomatoes	249	1
					Watermelon	40	3
					Marmelade, orange	19	1
Diethofencarb	F	7145	7141	4	Pears	202	3
					Tomatoes	145	1
Difenoconazole	DK	3179	3178	1	Currants, red	9	1
Difenoconazole	F	9827	9758	69	Apples	394	2
					Beans with pods	305	2
					Carambola	103	4
					Carrots	158	5
					Celeriac	7	1
					Celery	21	7
					Chervil	3	1
					Chilli peppers	42	3
					Coriander, leaves	9	3
					Dill	3	2
					Fennel	11	3
					Lettuce	208	2
					Melons	311	2
					Nectarines	212	1
					Papayas	89	6
					Parsley Root	6	2
					Passion fruits	38	2
					Peaches	158	1
					Pears	301	6
					Peas with pods	40	4
					Pitaya	19	4
					Plums	319	1
					Table grapes	459	1
					Tamarillo	20	1
					Tomatoes	249	3
Diflufenican	F	9948	9945	3	Peaches	158	1
					Pears	301	1
					Strawberries	266	1
Dimethoate (sum)	DK	3550	3531	19	Apples	214	5
					Carrots	340	1
					Cauliflowers	34	1
					Head cabbage, red	31	1
					Lettuce	163	5
					Plums	72	3
					Spring onions	3	1
					Rye kernels	59	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Wheat kernels	107	1
Dimethoate (sum)	F	10403	10332	71	Apples	393	7
					Apricots	31	1
					Beans with pods	305	10
					Cherries	24	2
					Chilli peppers	42	3
					Coriander, leaves	9	1
					Currants, black	17	1
					Jambolan	2	2
					Lemons	381	1
					Lettuce	208	11
					Limes	52	1
					Mandarins, clementines	411	1
					Oranges	491	4
					Passion fruits	38	1
					Peas with pods	40	17
					Persimmon	109	1
					Sapota	2	1
					Spinach	163	3
					Spring onions	32	2
					Vegetables, unspecified	3	1
Dimethomorph	DK	1597	1594	3	Ruccola	3	1
					Spring onions	1	1
					Strawberries	75	1
Dimethomorph	F	4516	4458	58	Beans with pods	121	1
					Blackberries	15	1
					Chives	4	1
					Cucumbers	89	8
					Lettuce	96	6
					Melons	139	3
					Ruccola	2	1
					Spring onions	15	3
					Strawberries	105	1
					Table grapes	193	16
					Tomatoes	91	3
					Wine, red	117	14
Diniconazole	F	1689	1688	1	Table grapes	58	1
Diphenylamine	DK	3881	3880	1	Strawberries	163	1
Diphenylamine	F	10951	10838	113	Apples	394	94
					Grapefruit	388	1
					Mandarins, clementines	411	3
					Oranges	491	5
					Pears	301	7
					Pomegranate	16	1
					Oranges, juice	44	2
Dithiocarbamates	DK	1880	1838	42	Apples	206	7
					Cucumbers	194	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Currants, black	5	2
					Currants, red	6	3
					Gherkin	3	1
					Lettuce	155	2
					Pears	165	15
					Peas with pods	5	1
					Plums	70	8
					Spinach	74	2
Dithiocarbamates	F	6022	5604	418	Apples	370	39
					Apricots	31	9
					Aubergines	80	1
					Bananas	405	1
					Basil	4	1
					Beans with pods	266	11
					Blueberries	38	1
					Celery	18	1
					Chilli peppers	31	6
					Courgettes	60	4
					Cucumbers	211	30
					Currants, red	19	5
					Figs, fresh	12	3
					Leek	60	10
					Lettuce	198	24
					Litchi	5	1
					Mango	50	1
					Melons	293	5
					Nectarines	204	13
					Papayas	83	31
					Passion fruits	36	11
					Peaches	149	28
					Pears	283	85
					Peas with pods	37	24
					Peppers, sweet	363	6
					Persimmon	99	1
					Pineapples	53	1
					Pitaya	15	3
					Plums	307	5
					Pomegranate	14	1
					Rambutan	44	1
					Raspberries	25	2
					Spinach	107	2
					Strawberries	165	2
					Table grapes	444	33
					Tamarillo	18	3
					Tomatoes	240	12
					Watermelon	35	1
Endosulfan (sum)	DK	5471	5470	1	Parsley (organic)	3	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
Endosulfan (sum)	F	11309	11199	110	Apples	394	6
					Apricots	31	1
					Avocados	39	1
					Beans with pods	305	1
					Beans, white	23	1
					Blackberries	35	1
					Blueberries	46	1
					Carrots	158	1
					Chilli peppers	42	5
					Chives	6	1
					Courgettes	63	5
					Cucumbers	218	2
					Currants, black	17	1
					Guava	9	2
					Lemons	380	2
					Lettuce	208	1
					Melons	311	33
					Nectarines	212	1
					Papayas	89	1
					Passion fruits	38	1
					Peaches	158	1
					Peppers, sweet	385	13
					Pineapples	55	1
					Pomegranate	16	1
					Radish	8	1
					Strawberries	266	5
					Table grapes	459	1
					Teas	24	2
					Tomatoes	249	14
					Watermelon	40	2
					Marmelade, orange	19	1
Epoxiconazole	DK	1597	1596	1	Brussels sprouts	13	1
Epoxiconazole	F	4516	4515	1	Grapefruit	155	1
Ethion	F	10951	10942	9	Aubergines	87	1
					Chilli peppers	42	2
					Grapefruit	388	2
					Guava	9	1
					Mandarins, clementines	411	1
					Pomegranate	16	1
					Table grapes	459	1
Ethoxyquin	F	6057	6056	1	Pears	201	1
Famoxadone	F	2886	2876	10	Beans with pods	81	1
					Cantharelle (Cantharellus cibarius)	4	1
					Leek	18	1
					Papayas	32	1
					Table grapes	127	5
					Tomatoes	65	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
Fenarimol	F	10951	10936	15	Currants, black	17	1
					Gooseberries	7	2
					Peaches	158	1
					Strawberries	266	5
					Table grapes	459	3
					Tomatoes	249	3
Fenazaquin	F	4516	4510	6	Apples	124	3
					Mandarins, clementines	160	1
					Nectarines	90	1
					Pears	123	1
Fenbuconazole	F	1689	1687	2	Grapefruit	69	1
					Nectarines	33	1
Fenhexamid	DK	2487	2442	45	Cherries	2	1
					Plums	60	1
					Strawberries	149	40
					Tomatoes	164	1
					Wine, red	2	2
Fenhexamid	F	8407	8012	395	Beans with pods	285	1
					Blackberries	20	1
					Blueberries	46	7
					Cucumbers	177	4
					Currants, black	13	1
					Currants, red	17	5
					Grapefruit	354	1
					Kiwi	327	102
					Lettuce	184	4
					Mixed berries	2	1
					Nectarines	192	16
					Oranges	408	1
					Parsley	4	1
					Peaches	136	11
					Peppers, sweet	346	4
					Pineapples	27	1
					Plums	286	9
					Raspberries	82	18
					Strawberries	225	47
					Table grapes	423	108
					Teas	25	1
					Tomatoes	180	10
					Wine, red	265	39
					Kiwi (organic)	22	1
					Table grapes (organic)	29	1
Fenitrothion	F	10951	10923	28	Apples	394	4
					Blueberries	46	1
					Celery	21	2
					Chilli peppers	42	1
					Currants, black	17	2

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Currants, red	28	1
					Kiwi	363	1
					Mandarins, clementines	411	2
					Nectarines	212	2
					Oranges	491	1
					Peaches	158	2
					Pears	301	1
					Plums	319	2
					Spinach	163	1
					Table grapes	459	5
Fenoxaprop-P-Ethyl	F	9956	9955	1	Peppers, sweet	385	1
Fenpropathrin	F	10951	10946	5	Apricots	31	1
					Grapefruit	388	1
					Oranges	491	2
					Peppers, sweet	385	1
Fenpropimorph	F	9827	9821	6	Bananas	425	4
					Potatoes, new	79	1
					Strawberries	266	1
Fenson	F	11309	11308	1	Lemons	380	1
Fenthion (sum)	F	10935	10893	42	Mandarins, clementines	411	18
					Oranges	491	10
					Peaches	158	2
					Persimmon	109	8
					Plums	319	2
					Marmelade, orange	19	2
Fenvalerat, esfenvalerat, RR- and SS-	F	11309	11295	14	Apples	394	4
					Aubergines	87	1
					Beans with pods	305	1
					Blackberries	35	1
					Carambola	103	1
					Mandarins, clementines	411	1
					Oranges	491	1
					Pak-choi	2	1
					Teas	24	3
Fenvalerat, esfenvalerat, RS- and SR-	F	11309	11300	9	Aubergines	87	1
					Beans with pods	305	1
					Carambola	103	1
					Kiwi	363	1
					Mandarins, clementines	411	1
					Pak-choi	2	1
					Teas	24	3
Flucythrinate	F	9871	9869	2	Grapefruit	388	1
					Table grapes	459	1
Fludioxonil	DK	3179	3168	11	Currants, red	9	1
					Strawberries	163	10
Fludioxonil	F	9827	9587	240	Apples	394	10

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Apricots	31	2
					Aubergines	87	2
					Beans with pods	305	3
					Blackberries	35	2
					Blueberries	46	4
					Chilli peppers	42	2
					Cucumbers	218	8
					Currants, red	28	3
					Grapefruit	388	1
					Kiwi	363	1
					Lettuce	208	5
					Mandarins, clementines	411	1
					Nectarines	212	8
					Oranges	491	4
					Peaches	158	2
					Pears	301	28
					Peppers, sweet	385	18
					Plums	319	4
					Pomegranate	16	2
					Raspberries	101	11
					Spinach	163	2
					Strawberries	266	50
					Table grapes	459	51
					Tomatoes	249	15
					Wine, red	181	1
Fluoxastrobin	F	3975	3973	2	Mandarins, clementines	160	2
Fluroxypyr (sum)	F	3975	3973	2	Peaches	64	1
					Table grapes	193	1
Flusilazole	F	7953	7948	5	Beans with pods	269	1
					Currants, black	9	1
					Peppers, sweet	336	1
					Sweet corn (small)	30	1
					Table grapes	409	1
Flutriafol	F	1689	1678	11	Peppers, sweet	62	11
Fluvalinate, tau-	F	3349	3344	5	Apples	180	1
					Grapefruit	96	2
					Mandarins, clementines	139	1
					Peppers, sweet	100	1
Glyphosate	DK	680	669	11	Barley (malting)	1	1
					Barley kernels	7	1
					Oat kernels	9	2
					Spelt, flour	16	1
					Wheat kernels	183	6
Glyphosate	F	864	848	16	Chick pea	7	1
					Lentils	15	5
					Barley grit	13	2
					Rolled oat	83	3

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Spelt, flour	22	1
					Wheat flour	181	2
					Wheat kernels	141	2
HCH (sum)	DK	3729	3728	1	Carrots	340	1
HCH (sum)	F	10951	10950	1	Ginger	28	1
Hexachlorobenzene	DK	3911	3908	3	Carrots	340	1
					Courgettes	20	1
					Parsnips	51	1
Hexachlorobenzene	F	10951	10950	1	Parsnips	10	1
Hexaconazole	F	7843	7835	8	Celery	13	1
					Chilli peppers	20	2
					Coriander, leaves	6	2
					Mint leaves	1	1
					Peppers, sweet	336	1
					Table grapes	409	1
Hexythiazox	F	4516	4499	17	Blackberries	15	1
					Grapefruit	155	1
					Lemons	158	4
					Mandarins, clementines	160	4
					Peppers, sweet	170	1
					Raspberries	43	3
					Strawberries	105	1
					Table grapes	193	1
					Tomatoes	91	1
Imazalil	DK	3363	3347	16	Cucumbers	199	11
					Potatoes	423	5
Imazalil	F	10310	8329	1981	Apples	392	5
					Bananas	425	309
					Chilli peppers	42	1
					Grapefruit	388	340
					Kiwi	361	3
					Lemons	381	321
					Limes	52	41
					Mandarins, clementines	410	386
					Melons	308	69
					Mineola	3	3
					Oranges	491	448
					Pears	299	13
					Pineapples	56	3
					Plums	317	2
					Pomelos	60	27
					Strawberries	265	1
					Watermelon	39	3
					Marmelade, orange	19	3
					Oranges, juice	43	1
					Limes (organic)	6	1
					Oranges (organic)	30	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
Iprodione	DK	3729	3719	10	Carrots	340	7
					Spinach	81	1
					Tomatoes	212	2
Iprodione	F	10951	10510	441	Apples	394	18
					Apricots	31	4
					Aspargus, green	38	1
					Beans with pods	305	21
					Blackberries	35	2
					Blueberries	46	3
					Boysenberries	3	1
					Carrots	158	4
					Cherries	24	1
					Chilli peppers	42	3
					Cucumbers	218	10
					Currants, red	28	11
					Head cabbage, red	7	1
					Kiwi	363	37
					Lemons	380	1
					Lettuce	208	16
					Mandarins, clementines	411	1
					Melons	311	2
					Nectarines	212	27
					Pak-choi	2	2
					Passion fruits	38	1
					Peaches	158	11
					Pears	301	7
					Peas without pods	43	2
					Peppers, sweet	385	4
					Pitaya	19	2
					Plums	319	97
					Pomelos	61	1
					Radish	8	1
					Raspberries	101	7
					Ruccola	12	1
					Spinach	163	2
					Spring onions	32	1
					Strawberries	266	14
					Table grapes	459	91
					Tomatoes	249	24
					Rice, white	167	1
					Wine, red	181	8
Iprovalicarb	F	3975	3957	18	Peas with pods	26	1
					Table grapes	193	8
					Tomatoes	91	1
					Wine, red	117	8
Kresoxim-methyl	DK	3881	3877	4	Apples	213	1
					Currants, black	11	3

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
Kresoxim-methyl	F	10951	10912	39	Beans with pods	305	1
					Currants, red	28	5
					Passion fruits	38	2
					Pears	301	1
					Peppers, sweet	385	5
					Strawberries	266	14
					Table grapes	459	11
Lindane	F	11309	11308	1	Ginger	28	1
Linuron	DK	2485	2452	33	Carrots	281	22
					Celery	11	1
					Parsley	3	1
					Parsley Root	20	3
					Parsnips	36	4
					Spinach	79	1
					Spring onions	3	1
Linuron	F	8377	8338	39	Apples	276	1
					Bananas	343	1
					Carrots	108	27
					Celeriac	5	1
					Celery	14	1
					Kiwi	326	1
					Lemons	348	1
					Parsley Root	5	1
					Parsnips	8	1
					Pears	242	1
					Raspberries	82	2
					Spinach	149	1
Malathion (sum)	DK	5371	5347	24	Plums	72	1
					Rye flour	28	1
					Rye kernels	100	4
					Spelt	30	3
					Spelt, flour	16	1
					Wheat flour	78	3
					Wheat kernels	187	11
Malathion (sum)	F	11435	11241	194	Apples	393	2
					Blackberries	35	1
					Celery	21	2
					Currants, red	28	1
					Grapefruit	388	9
					Kiwi	363	2
					Kumquates	14	5
					Lemons	381	3
					Mandarins, clementines	411	110
					Melons	311	1
					Nectarines	212	1
					Oranges	491	30
					Peaches	158	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Peppers, sweet	385	5
					Persimmon	109	1
					Strawberries	266	1
					Table grapes	458	1
					Tamarillo	20	1
					Cornflour	8	2
					Rice, white	167	6
					Rye flour	57	1
					Rye kernels	47	1
					Spelt, flour	22	1
					Wheat flour	184	3
					Wheat kernels	143	2
					Beans, kidney (organic)	10	1
Mecoprop (sum)	F	4516	4515	1	Pears	123	1
Mepiquat	DK	1089	1087	2	Barley (malting)	1	1
					Rye kernels	136	1
Mepiquat	F	2198	2175	23	Mushroom (Agaricus bisporus)	12	2
					Okra (Lady's fingers)	4	1
					Sweet corn (small)	18	1
					Rye flour	73	3
					Rye kernels	73	1
					Spelt	13	3
					Spelt, flour	22	2
					Wheat kernels	185	10
Metalaxyl (sum)	DK	3802	3797	5	Lettuce	163	3
					Potatoes	424	1
					Radish	3	1
Metalaxyl (sum)	F	11103	11002	101	Basil	11	1
					Basil (Ocimum sanctum)	2	1
					Beans with pods	305	1
					Chervil	3	1
					Chilli peppers	42	5
					Coriander, leaves	9	2
					Cucumbers	218	21
					Grapefruit	388	1
					Lemons	381	1
					Lettuce	208	14
					Mandarins, clementines	411	1
					Melons	311	1
					Peas with pods	40	3
					Peppers, sweet	385	2
					Pitaya	19	2
					Potatoes, new	79	5
					Ruccola	12	2
					Strawberries	266	2
					Table grapes	458	16
					Tomatoes	250	2

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Wine, red	266	17
Methacrifos	F	8849	8848	1	Beans with pods	292	1
Methamidophos	F	10514	10491	23	Apples	393	1
					Beans with pods	305	5
					Chilli peppers	42	1
					Cucumbers	218	2
					Figs, fresh	13	1
					Melons	311	2
					Nectarines	211	1
					Oranges	491	1
					Papayas	89	1
					Peaches	158	1
					Peas with pods	40	1
					Peppers, sweet	385	2
					Plums	318	1
					Strawberries	265	1
					Watermelon	39	2
Methidathion	F	10424	10328	96	Grapefruit	388	16
					Guava	9	1
					Lemons	380	27
					Mandarins, clementines	411	20
					Oranges	491	28
					Pomelos	61	4
Methiocarb (sum)	F	8845	8834	11	Onions	52	1
					Peppers, sweet	346	8
					Plums	286	1
					Table grapes	423	1
Methomyl and Thiodicarb	F	8948	8862	86	Apples	277	2
					Basil	9	1
					Beans with pods	285	7
					Boysenberries	2	1
					Carambola	97	18
					Chilli peppers	26	1
					Cucumbers	177	4
					Jambolan	2	2
					Lettuce	184	10
					Melons	273	6
					Oranges	408	1
					Papayas	87	9
					Pears	244	3
					Peas with pods	40	2
					Peppers, sweet	346	3
					Plums	286	1
					Sapota	2	1
					Spinach	149	1
					Strawberries	225	4
					Table grapes	423	6

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Tea, herbal	1	1
					Vegetables, unspecified	3	1
					Watermelon	39	1
Metribuzin	F	2886	2884	2	Wine, red	91	2
Mevinphos	DK	3762	3761	1	Lettuce	163	1
Monocrotophos	F	11078	11077	1	Cherries	24	1
Myclobutanil	F	10951	10821	130	Apples	394	2
					Bananas	425	22
					Beans with pods	305	2
					Cherries	24	4
					Chilli peppers	42	3
					Cucumbers	218	3
					Lemons	380	2
					Mandarins, clementines	411	7
					Melons	311	4
					Nectarines	212	2
					Oranges	491	7
					Peaches	158	1
					Peppers, sweet	385	8
					Pomelos	61	11
					Strawberries	266	18
					Table grapes	459	33
					Tomatoes	249	1
Ofurace	F	8510	8509	1	Wine, red	266	1
Orthophenylphenol	F	9827	9266	561	Apples	394	3
					Beans with pods	305	1
					Grapefruit	388	149
					Kiwi	363	1
					Lemons	380	87
					Mandarins, clementines	411	132
					Melons	311	5
					Mineola	3	2
					Nectarines	212	1
					Oranges	491	165
					Peaches	158	1
					Peppers, sweet	385	2
					Pomelos	61	3
					Potatoes, new	79	1
					Raspberries	101	3
					Spinach	163	1
					Juice, grapefruite	1	1
					Marmelade, orange	19	2
					Pear, canned	9	1
Oxamyl	F	8407	8395	12	Courgettes	36	1
					Cucumbers	177	1
					Limes	46	3
					Melons	273	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Peppers, sweet	346	2
					Pineapples	27	1
					Tomatoes	180	3
Oxydemeton-methyl (sum)	F	10448	10444	4	Apples	392	1
					Carambola	103	1
					Pears	300	1
					Pineapples	55	1
Parathion-methyl (sum)	F	10951	10939	12	Apples	394	1
					Basil	11	1
					Figs, fresh	13	1
					Grapefruit	388	4
					Guava	9	1
					Mandarins, clementines	411	1
					Nectarines	212	1
					Pomelos	61	1
					Sesame seed	18	1
Penconazole	F	10951	10917	34	Peaches	158	1
					Pears	301	1
					Peppers, sweet	385	5
					Strawberries	266	4
					Table grapes	459	23
Pendimethalin	DK	2404	2403	1	Kale	9	1
Pendimethalin	F	7145	7143	2	Carrots	85	1
					Peppers, sweet	285	1
Pentachlorobenzene	F	8496	8495	1	Carrots	132	1
Pentachlorophenol	F	10951	10950	1	Grapefruit	388	1
Permethrin (sum)	F	11309	11290	19	Celery	21	1
					Coriander, leaves	9	1
					Ginger	28	1
					Lettuce	208	1
					Litchi	7	1
					Mango	58	1
					Melons	311	6
					Oranges	491	1
					Tamarillo	20	2
					Watermelon	40	1
					Witloof	3	1
					Rice, white	167	1
					Wheat kernels	143	1
Phenthoate	F	10951	10949	2	Oranges	491	2
Phorate (sum)	F	9950	9946	4	Ginger	28	2
					Papayas	89	1
					Pears	301	1
Phosalone	DK	3881	3863	18	Apples	213	17
					Plums	72	1
Phosalone	F	10951	10932	19	Apples	394	9
					Gooseberries	7	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Pears	301	3
					Plums	319	4
					Rambutan	47	1
					Marmelade, orange	19	1
Phosmet (sum)	F	10951	10921	30	Apples	394	9
					Currants, red	28	1
					Mandarins, clementines	411	4
					Nectarines	212	1
					Oranges	491	4
					Peaches	158	5
					Pears	301	1
					Persimmon	108	1
					Plums	319	2
					Blueberry, dried	1	1
					Pears (organic)	35	1
Pirimicarb (sum)	DK	3812	3791	21	Apples	214	8
					Lettuce	163	5
					Plums	72	2
					Strawberries	163	6
Pirimicarb (sum)	F	11077	11051	26	Apples	393	8
					Beans with pods	305	3
					Brussels sprouts	15	1
					Celery	21	1
					Lemons	381	1
					Lettuce	208	3
					Mandarins, clementines	411	2
					Pears	301	3
					Peppers, sweet	385	1
					Strawberries	266	3
Pirimiphos-methyl	DK	5471	5463	8	Celeriac	12	1
					Maize	1	1
					Wheat flour	78	6
Pirimiphos-methyl	F	11309	11198	111	Chilli peppers	42	2
					Grapefruit	388	2
					Lemons	380	3
					Mandarins, clementines	411	3
					Melons	311	1
					Oranges	491	7
					Peppers, sweet	385	5
					Persimmon	108	1
					Sesame seed	18	1
					Cornflour	8	2
					Maize	41	1
					Rice, white	167	13
					Rolled oat	86	2
					Rye flour	57	6
					Rye kernels	47	7

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Spelt	13	1
					Wheat bran	13	2
					Wheat flour	184	30
					Wheat kernels	143	15
					Pasta	43	5
					Pasta, dried	32	2
Prochloraz (sum)	DK	3179	3170	9	Mushroom (Agaricus bisporus)	41	9
Prochloraz (sum)	F	9827	9645	182	Avocados	39	1
					Grapefruit	388	13
					Lemons	380	41
					Limes	52	3
					Mandarins, clementines	411	35
					Mango	58	18
					Mushroom (Agaricus bisporus)	35	8
					Oranges	491	23
					Papayas	89	30
					Pineapples	55	1
					Pomelos	61	9
Procymidone	F	10951	10799	152	Apples	394	1
					Beans with pods	305	2
					Blueberries	46	1
					Cauliflowers	51	1
					Chilli peppers	42	3
					Courgettes	63	2
					Cucumbers	218	14
					Kiwi	363	3
					Lettuce	208	9
					Mandarins, clementines	411	1
					Melons	311	9
					Nectarines	212	1
					Peaches	158	1
					Pears	301	1
					Peas without pods	43	1
					Peppers, sweet	385	26
					Plums	319	2
					Raspberries	101	8
					Spring onions	32	1
					Strawberries	266	17
					Table grapes	459	13
					Tomatoes	249	35
Profenofos	F	10951	10927	24	Beans with pods	305	2
					Chilli peppers	42	7
					Coriander, leaves	9	1
					Lemons	380	1
					Mandarins, clementines	411	1
					Okra (Lady's fingers)	15	1
					Oranges	491	4

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Passion fruits	38	3
					Peas with pods	40	2
					Pomelos	61	1
					Strawberries	266	1
Propamocarb (sum)	DK	1597	1575	22	Cucumbers	77	21
					Tomatoes	75	1
Propamocarb (sum)	F	4516	4428	88	Aubergines	32	2
					Beans with pods	121	1
					Carrots	50	2
					Cucumbers	89	49
					Leek	20	1
					Lettuce	96	5
					Melons	139	1
					Papayas	48	2
					Peppers, sweet	170	8
					Potatoes	40	3
					Radish	3	1
					Ruccola	2	1
					Spinach	66	3
					Spring onions	15	1
					Strawberries	105	1
					Tomatoes	91	7
Propargite	F	9827	9763	64	Apples	394	34
					Apricots	31	1
					Beans with pods	305	1
					Grapefruit	388	1
					Lemons	380	5
					Mandarins, clementines	411	3
					Mixed berries	2	1
					Nectarines	212	2
					Okra (Lady's fingers)	15	1
					Oranges	491	6
					Peppers, sweet	385	1
					Plums	319	5
					Table grapes	459	1
					Tomatoes	249	1
					Lemons (organic)	26	1
Propiconazole	F	11430	11421	9	Chilli peppers	42	1
					Coriander, leaves	9	2
					Currants, black	17	1
					Mandarins, clementines	411	1
					Mango	58	1
					Peas with pods	40	1
					Rambutan	47	1
					Tomatoes	249	1
Propoxur	F	8948	8947	1	Tamarillo	20	1
Propyzamide	F	10951	10945	6	Beans with pods	305	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
					Lettuce	208	5
Prothiofos	F	11309	11300	9	Aubergines	87	1
					Grapefruit	388	2
					Guava	9	2
					Oranges	491	4
Pymetrozine	F	4516	4503	13	Cucumbers	89	6
					Peppers, sweet	170	4
					Spinach	66	1
					Strawberries	105	1
					Tomatoes	91	1
Pyraclostrobin	DK	1597	1560	37	Apples	69	9
					Pears	68	4
					Plums	29	7
					Spinach	41	1
					Strawberries	75	16
Pyraclostrobin	F	4516	4340	176	Apples	124	19
					Beans with pods	121	1
					Blueberries	41	1
					Brussels sprouts	7	3
					Grapefruit	155	24
					Lemons	158	4
					Lettuce	96	4
					Limes	18	1
					Mandarins, clementines	160	1
					Nectarines	90	2
					Oranges	173	7
					Peaches	64	3
					Pears	123	55
					Peppers, sweet	170	1
					Pomelos	34	3
					Raspberries	43	1
					Ruccola	2	2
					Strawberries	105	18
					Table grapes	193	19
					Tomatoes	91	7
Pyrazophos	F	11077	11076	1	Wine, red	266	1
Pyrethrins	F	9827	9825	2	Peppers, sweet (organic)	26	1
					Tomatoes (organic)	25	1
Pyridaben	F	7145	7126	19	Grapefruit	292	6
					Lemons	290	3
					Mandarins, clementines	272	3
					Peaches	111	1
					Tomatoes	145	5
					Gojiberries, dried	1	1
Pyridate (sum)	F	4015	4014	1	Mandarins, clementines	52	1
Pyrimethanil	DK	3091	3033	58	Apples	214	1
					Cucumbers	199	20

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
					Plums	72	1
					Strawberries	163	31
					Tomatoes	212	5
Pyrimethanil	F	9429	9294	135	Apples	392	7
					Aubergines	86	1
					Bananas	425	2
					Chilli peppers	42	1
					Cucumbers	216	5
					Lemons	273	10
					Limes	36	1
					Mandarins, clementines	303	5
					Oranges	377	2
					Papayas	89	1
					Pears	299	10
					Peppers, sweet	382	10
					Plums	318	2
					Raspberries	101	15
					Strawberries	266	8
					Table grapes	457	30
					Tomatoes	250	22
					Marmelade, orange	19	1
					Wine, red	266	2
Pyriproxyfen	F	4516	4423	93	Aubergines	32	2
					Grapefruit	155	13
					Lemons	158	44
					Mandarins, clementines	160	17
					Oranges	173	7
					Peppers, sweet	170	2
					Pomelos	34	1
					Tomatoes	91	7
Quinalphos	F	10951	10950	1	Kiwi	363	1
Quinoxyfen	F	1689	1688	1	Melons	51	1
Quintozene (sum)	DK	5471	5459	12	Carrots	340	6
					Courgettes	20	1
					Parsnips	51	2
					Potatoes	424	2
					Spinach	81	1
Quintozene (sum)	F	11309	11300	9	Carrots	158	1
					Courgettes	63	1
					Cucumbers	218	1
					Kiwi	363	1
					Parsnips	10	2
					Peppers, sweet	385	3
Quizalofop	F	3975	3972	3	Pears	123	1
					Spinach	66	2
Spiroxamine	F	4516	4505	11	Table grapes	193	11
Tebuconazole	DK	3881	3877	4	Brussels sprouts	18	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Leek	38	2
					Parsnips	51	1
Tebuconazole	F	10951	10776	175	Apples	394	1
					Apricots	31	5
					Beans with pods	305	1
					Carrots	158	4
					Cherries	24	3
					Courgettes	63	1
					Cucumbers	218	1
					Currants, black	17	1
					Currants, red	28	4
					Figs, fresh	13	1
					Grapefruit	388	2
					Guava	9	1
					Kiwi	363	1
					Leek	68	5
					Lemons	380	1
					Lettuce	208	1
					Limes	52	1
					Mandarins, clementines	411	4
					Melons	311	2
					Nectarines	212	40
					Papayas	89	1
					Peaches	158	27
					Peas with pods	40	13
					Peppers, sweet	385	6
					Persimmon	108	1
					Plums	319	15
					Rhubarbs	8	1
					Table grapes	459	21
					Tomatoes	249	9
					Rolled oat	86	1
Tebufenozide	F	2886	2882	4	Apples	85	2
					Peppers, sweet	117	1
					Wine, red	91	1
Tebufenpyrad	F	7145	7114	31	Apples	213	3
					Grapefruit	292	1
					Lemons	290	2
					Mandarins, clementines	272	7
					Nectarines	158	1
					Oranges	326	3
					Peaches	111	1
					Pears	202	1
					Strawberries	178	3
					Table grapes	348	9
Tecnazene	F	10951	10949	2	Ginger	28	1
					Kiwi	363	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
Tetrachlorvinphos	F	11072	11071	1	Oranges	491	1
Tetraconazole	F	1689	1687	2	Peaches	18	1
					Peas with pods	16	1
Tetradifon	F	10951	10938	13	Basil	11	2
					Chilli peppers	42	1
					Grapefruit	388	1
					Kumquates	14	2
					Lemons	380	2
					Mandarins, clementines	411	1
					Oranges	491	2
					Passion fruits	38	1
					Strawberries	266	1
Thiabendazole	DK	3494	3492	2	Cucumbers	198	1
					Potatoes	424	1
Thiabendazole	F	10483	9449	1034	Apples	392	70
					Avocados	40	1
					Bananas	425	184
					Beans with pods	305	2
					Grapefruit	388	255
					Kiwi	362	8
					Lemons	381	91
					Lettuce	206	1
					Limes	52	20
					Mandarins, clementines	411	133
					Mango	58	18
					Melons	308	4
					Mineola	3	2
					Nectarines	210	2
					Oranges	491	137
					Papayas	89	54
					Peaches	158	2
					Pears	299	27
					Peppers, sweet	382	1
					Pitaya	19	1
					Plums	317	2
					Pomelos	61	15
					Rambutan	47	1
					Raspberries	101	1
					Tamarillo	20	1
					Watermelon	39	1
Thiophanate-methyl	F	8407	8342	65	Apples	277	7
					Beans with pods	285	2
					Cucumbers	177	1
					Currants, red	17	1
					Gooseberries	6	1
					Head cabbage, spring	13	1
					Lemons	348	1

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples ana-lysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples ana-lysed	Number of samples with detected residues
					Lettuce	184	1
					Mandarins, clementines	356	4
					Melons	273	2
					Papayas	87	6
					Passion fruits	23	2
					Peaches	136	7
					Pears	244	10
					Quince	2	1
					Shallots	11	1
					Spinach	149	1
					Strawberries	225	5
					Table grapes	423	1
					Teas	25	1
					Tomatoes	180	2
					Wine, red	265	6
					Wine, white	7	1
Tolclofos-methyl	F	11073	11064	9	Carrots	158	4
					Lettuce	208	5
Tolylfluanid (sum)	DK	3881	3823	58	Apples	213	17
					Currants, black	11	7
					Currants, red	9	3
					Pears	165	7
					Raspberries	8	3
					Strawberries	163	19
					Tomatoes	212	2
Tolylfluanid (sum)	F	10951	10837	114	Apples	394	27
					Cucumbers	218	1
					Currants, black	17	1
					Currants, red	28	14
					Gooseberries	7	1
					Pears	301	52
					Raspberries	101	11
					Strawberries	266	4
					Tomatoes	249	3
Triadimefon (sum)	F	11072	10952	120	Aubergines	87	2
					Beans with pods	305	1
					Carambola	103	13
					Chilli peppers	42	1
					Coriander, leaves	9	1
					Courgettes	63	1
					Cucumbers	218	2
					Grapefruit	388	1
					Melons	311	7
					Peppers, sweet	385	14
					Persimmon	109	1
					Pineapples	55	37
					Pomelos	61	2

Pesticide	Origin of samples (DK=Domestic; F=Foreign)	Number of samples analysed	No. of samples without detected pesticides	Number of samples with detected pesticides	Commodity	Number of samples analysed	Number of samples with detected residues
					Spinach	163	1
					Strawberries	266	12
					Table grapes	458	13
					Tomatoes	249	9
					Gojiberries, dried	1	1
					Wine, red	266	1
Triallate	F	3975	3973	2	Grapefruit	155	1
					Plums	131	1
Triazophos	F	11072	11066	6	Aubergines	87	1
					Pomelos	61	5
Trichlorfon	F	9948	9945	3	Figs, fresh	13	1
					Persimmon	109	1
					Tomatoes	249	1
Trichloronat	DK	3881	3880	1	Chinese radish	1	1
Trifloxystrobin	F	10951	10864	87	Apples	394	13
					Courgettes	63	1
					Cucumbers	218	1
					Currants, red	28	3
					Grapefruit	388	4
					Nectarines	212	2
					Oranges	491	5
					Passion fruits	38	1
					Peaches	158	2
					Pears	301	7
					Peppers, sweet	385	3
					Strawberries	266	4
					Table grapes	459	41
Triflumuron	F	3975	3954	21	Apples	124	7
					Nectarines	90	8
					Peaches	64	5
					Pears	123	1
Vinclozolin (sum)	DK	5441	5440	1	Peas without pods	10	1
Vinclozolin (sum)	F	11309	11229	80	Beans with pods	305	16
					Carrots	158	2
					Kiwi	363	27
					Lettuce	208	8
					Nectarines	212	2
					Peaches	158	1
					Peas without pods	43	11
					Raspberries	101	12
					Table grapes	459	1

7.4 Consumption used for exposure calculations.

Consumer group	Adults	Male	Female	Children	Male High F&V [a)]	Female High F&V [a)]	Assumed domestic consump-tion
Age (years)	15-75	15-75	15-75	4-6	15-75	15-75	
Avg. weight (kg)	75.1	83.5	68.2	21.8	84.4	69	
No. of individuals in group	1599	721	878	106	118	258	
			Average consumption (g/kg bw/day)				
Apples	0.957	0.811	1.08	2.54	2.0	1.9	35%
Apricot, dried	0.00401	0.00224	0.00546	0.016	0.00575	0.00945	0%
Apricots	0.000055	0.0	0.0001	0.0	0.0	0.00034	0%
Asparagus	0.0138	0.012	0.0153	0.00485	0.0155	0.0198	5%
Aubergines	0.0108	0.00984	0.0115	0.00272	0.0275	0.0205	0%
Avocados	0.0298	0.014	0.0428	0.0165	0.0353	0.064	0%
Bananas	0.454	0.347	0.541	1.27	0.69	0.883	0%
Barley grit	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	7%
Barley kernels	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	100%
Beans with pods	0.018	0.0157	0.0199	0.0317	0.0283	0.0314	2%
Beans, dried	0.00594	0.00685	0.00518	0.0141	0.00849	0.00835	0%
Berries, dried	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Berries, others	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	21%
Blueberries	0.000057	0.000126	0.0	0.0	0.0	0.0	0%
Broccoli	0.0344	0.0268	0.0407	0.0465	0.0727	0.0698	25%
Brussels sprouts	0.0143	0.0113	0.0167	0.0194	0.0303	0.029	55%
Carrots	0.498	0.349	0.62	1.48	0.558	1.04	68%
Cauliflower	0.0374	0.0332	0.0409	0.0307	0.0588	0.0589	40%
Celeriac	0.0138	0.013	0.0145	0.0337	0.0147	0.019	63%
Celery	0.00681	0.00471	0.00854	0.00368	0.015	0.0179	34%
Cherries	0.000489	0.000334	0.000616	0.00119	0.0	0.00102	11%
Chervil	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Chick pea	0.000187	0.000077	0.000278	0.0	0.000239	0.000578	0%
Chilli peppers	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Chives	0.00092	0.000658	0.00114	0.000733	0.00105	0.0014	0%
Coriander, leaves	0.000013	0.0	0.000024	0.0	0.0	0.000025	0%
Corn, dried	0.0053	0.00346	0.00681	0.043	0.00207	0.00873	2%
Cornflour	0.000905	0.000836	0.000961	0.00605	0.000752	0.000572	0%
Courgettes	0.0215	0.02	0.0227	0.0052	0.0647	0.0419	24%
Cucumbers	0.222	0.162	0.271	1.35	0.324	0.406	48%
Currants	0.000054	0.0	0.000098	0.0	0.0	0.000166	31%
Dill	0.000339	0.000187	0.000463	0.000147	0.000621	0.000625	25%
Fennel	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Figs, fresh	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Fruit (other), dried	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Fruit, exotic	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Fruit, mixed	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Garlics	0.0012	0.00104	0.00134	0.000271	0.00176	0.00169	0%
Gherkin	0.0212	0.0245	0.0184	0.0295	0.0242	0.0188	100%
Gooseberries	0.000076	0.000169	0.0	0.0	0.0	0.0	36%
Grapefruit	0.0189	0.0122	0.0245	0.0254	0.0327	0.047	0%
Head cabbage	0.0649	0.0505	0.0768	0.0745	0.073	0.118	69%
Head cabbage, red	0.0188	0.0242	0.0144	0.0233	0.0163	0.0172	82%
Herbs	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	3%

Consumer group	Adults	Male	Female	Children	Male High F&V [a)]	Female High F&V [a)]	Assumed domestic consump-tion
Age (years)	15-75	15-75	15-75	4-6	15-75	15-75	
Avg. weight (kg)	75.1	83.5	68.2	21.8	84.4	69	
No. of individuals in group	1599	721	878	106	118	258	
	Average consumption (g/kg bw/day)						
Kale	0.0048	0.00466	0.00492	0.00843	0.00311	0.00806	82%
Kiwi	0.0426	0.0122	0.0676	0.129	0.03	0.138	0%
Leek	0.0269	0.0231	0.03	0.0318	0.0308	0.0421	36%
Lemons, lime	0.00803	0.00515	0.0104	0.0128	0.00461	0.0151	0%
Lentils	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Lettuce	0.0903	0.0746	0.103	0.066	0.111	0.126	54%
Lettuce, iceberg	0.000016	0.000012	0.000019	0.000355	0.0	0.000028	29%
Mandarins, clementines	0.108	0.0698	0.14	0.145	0.187	0.269	0%
Mango	0.00574	0.00196	0.00884	0.00685	0.00298	0.0161	0%
Marmelade, orange	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Melons	0.139	0.0652	0.2	0.773	0.166	0.423	0%
Mineola	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Mushroom	0.0421	0.042	0.0421	0.0448	0.0531	0.0587	50%
Nectarines	0.0668	0.0483	0.0821	0.188	0.131	0.142	0%
Oat kernels	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	33%
Okra (Lady's fingers)	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Onions	0.149	0.156	0.144	0.21	0.184	0.176	79%
Oranges	0.143	0.0924	0.185	0.192	0.248	0.356	0%
Oranges, juice	0.647	0.575	0.706	1.79	0.992	0.892	0%
Papayas	0.000941	0.000322	0.00145	0.00112	0.000489	0.00265	0%
Parsley	0.000869	0.000572	0.00111	0.000648	0.00129	0.00147	38%
Parsley Root	0.00287	0.00256	0.00312	0.00204	0.00933	0.00734	85%
Parsnips	0.00568	0.00512	0.00614	0.00409	0.0187	0.0145	84%
Pasta	0.077	0.0814	0.0734	0.291	0.105	0.0719	0%
Peaches	0.069	0.0499	0.0846	0.192	0.134	0.146	0%
Pear, canned	0.00196	0.00151	0.00233	0.00358	0.00283	0.0038	0%
Pears	0.323	0.229	0.4	0.76	0.632	0.794	35%
Peas with pods	0.000403	0.000164	0.000599	0.00587	0.0	0.00104	13%
Peas without pods	0.119	0.106	0.131	0.135	0.185	0.191	19%
Peppers, sweet	0.0995	0.074	0.12	0.248	0.122	0.19	1%
Persimmon	0.00273	0.000933	0.0042	0.00326	0.00142	0.00767	0%
Pineapples	0.0394	0.0203	0.0551	0.0624	0.044	0.0969	0%
Plums	0.0416	0.0257	0.0546	0.0887	0.0803	0.0899	18%
Pomegranate	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Pomelos	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Potatoes	1.27	1.49	1.09	2.27	1.51	1.04	84%
Radish	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	27%
Raisin	0.0219	0.0135	0.0287	0.103	0.0283	0.0489	0%
Raspberries, blackberries	0.0103	0.00507	0.0145	0.0205	0.0121	0.0315	6%
Rhubarbs	0.00251	0.00232	0.00266	0.00582	0.00531	0.00427	11%
Rice	0.0821	0.0829	0.0814	0.162	0.111	0.0927	0%
Rice, short grained	0.00217	0.00163	0.00262	0.0263	0.00194	0.00288	0%
Rolled oat	0.109	0.123	0.0977	0.34	0.137	0.104	39%
Ruccola	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	40%
Rye flour	0.527	0.599	0.468	1.63	0.665	0.527	57%
Sesame seed	0.000247	0.0	0.000449	0.000299	0.0	0.000384	0%
Spinach	0.0114	0.0109	0.0118	0.0225	0.00804	0.0177	33%
Spring onions	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	9%
Strawberries	0.0707	0.0398	0.096	0.137	0.0952	0.199	38%

Consumer group	Adults	Male	Female	Children	Male High F&V [a)]	Female High F&V [a)]	Assumed domestic consump-tion
Age (years)	15-75	15-75	15-75	4-6	15-75	15-75	
Avg. weight (kg)	75.1	83.5	68.2	21.8	84.4	69	
No. of individuals in group	1599	721	878	106	118	258	
	Average consumption (g/kg bw/day)						
Sweet corn (small)	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Table grapes	0.173	0.0995	0.234	0.372	0.269	0.401	0%
Teas	0.022	0.014	0.0286	0.0025	0.024	0.0335	0%
Tomatoes	0.518	0.464	0.563	0.971	0.74	0.756	46%
Vegetables, unspecified	0.000133	0.00012	0.000147	0.000458	0.000118	0.000145	0%
Watermelon	0.0392	0.0184	0.0563	0.218	0.0468	0.119	0%
Wheat bran	0.00364	0.00369	0.00361	0.0101	0.00382	0.00321	13%
Wheat flour	1.12	1.13	1.11	3.12	1.11	1.06	49%
Wine, red	0.979	1.02	0.947	0.0	1.25	0.987	1%
Wine, white	0.261	0.222	0.294	0.0	0.197	0.246	0%

[a)] Consumption over 550 g of fruits and vegetables (excluding potatoes)

7.5 ADIs for pesticides included in the risk assessment.

The information concerning ADIs are mainly from the EU Pesticide database (http://ec.europa.eu/sanco_pesticides/public/index.cfm?event=homepage&CFID=9015839&CFTOKEN=26271605&jsessionid=08049d004dc4b5e4b7b2TR)

Pesticide	ADI mg/kg bw/day	Source	Pesticide	ADI mg/kg bw/day	Source
2,4-D (sum)	0.05	COM 2001	Dichlorvos	0.00008	EFSA 2006, tentative
Acephate	0.03	JMPR 2005	Dicloran	0.005	EFSA 2010
Acetamiprid	0.07	COM 2004	Dicofol (sum)	0.002	JMPR 1994
Aclonifen	0.07	COM 2008	Diethofencarb	0.43	EFSA 2010
Aldicarb (sum)	0.003	JMPR 2001	Difenoconazole	0.01	COM 2008
Aldrin and Dieldrin	0.0001	JMPR 2004	Diflufenican	0.2	COM 2008
Atrazine	0.02	JMPR 2007	Dimethoate	0.001	COM 2007
Azinphos-methyl	0.005	Com 2006	Dimethomorph	0.05	COM 2007
Azoxystrobin	0.2	EFSA 2010	Diniconazole	0.02	DAR, FR
Benalaxyl (sum)	0.04	EFSA 2007	Diphenylamine	0.075	EFSA 2008
Benfuracarb	0.01	COM 2009	Dithiocarbamates	0.05	For mancozeb, COM 2005
Bifenthrin	0.015	EFSA 2011	Endosulfan (sum)	0.006	JMPR 2006
Binapacryl		No ADI (JMPR 1985)	Epoxiconazole	0.008	EFSA 2008
Biphenyl	0.125	JMPR 1967	Ethion	0.002	JMPR 1990
Bitertanol	0.003	COM 2011	Ethoxyquin	0.005	JMPR 2005
Bromopropylate	0.03	JMPR 1993	Famoxadone	0.012	COM 2002
Bupirimate	0.05	COM 2011	Fenarimol	0.01	COM 2006
Buprofezin	0.01	COM 2010	Fenazaquin	0.005	COM 2011
Captafol		No ADI (JMPR 1985)	Fenbuconazole	0.006	COM 2010
Captan/Folpet (sum)	0.1	COM 2008	Fenhexamid	0.2	COM 2001
Carbaryl	0.0075	EFSA 2006	Fenitrothion	0.005	EFSA 2006
Carbendazim and benomyl	0.02	COM 2006	Fenoxaprop-P-Ethyl	0.01	COM 2008
Carbofuran (sum)	0.00015	EFSA 2009	Fenpropathrin	0.03	JMPR 1993
Carbosulfan	0.005	EFSA 2009	Fenpropimorph	0.003	COM 2008
Chlorfenvinphos	0.0005	JMPR 1994	Fenson		No information (COM 2002)
Chlormequat	0.04	EFSA 2008	Fenthion (sum)	0.007	JMPR 2000
Chlorothalonil	0.015	COM 2006	Fenvalerat, esfenvale-rat, RR- and SS-	0.02	COM 2000
Chlorpropham	0.05	COM 2003	Fenvalerat, esfenvale-rat, RS- and SR-	0.02	JMPR 1986
Chlorpropham (sum)	0.05	COM 2004	Flucythrinate	0.02	JMPR 1985
Chlorpyrifos	0.01	COM 2005	Fludioxonil	0.37	COM 2007
Chlorpyrifos-methyl	0.01	COM 2005	Fluoxastrobin	0.015	COM 2008
Chlorthal-dimethyl	0.01	DAR 2007, EL	Fluroxypyr (sum)	0.8	COM 2010
Clofentezine	0.02	COM 2010	Flusilazole	0.002	COM 2007
Cyfluthrin (sum)	0.003	COM 2003	Flutriafol	0.01	EFSA 2011
Cyhalothrin, lambda-	0.005	COM 2001	Fluvalinate, tau-	0.005	COM 2010
Cypermethrin (sum)	0.05	COM 2005	Glyphosate	0.3	COM 2001
Cyprodinil	0.03	COM 2006	HCH (sum)		No information (JMPR 1973)
Cyromazine	0.06	COM 2009	Hexachlorobenzene		ADI withdrawn (JMPR 1978)
DDT (sum)	0.01	JMPR 2000	Hexaconazole	0.005	JMPR 1990
Deltamethrin	0.01	Com 2003	Hexythiazox	0.03	COM 2011
Diazinon	0.0002	EFSA 2006	Imazalil	0.025	EFSA 2010
Dichlofluanid	0.3	JMPR 1983	Iprodione	0.06	COM 2002
Dichlorprop	0.06	COM 2007	Iprovalicarb	0.015	COM 2002

Pesticide	ADI mg/kg bw/day	Source	Pesticide	ADI mg/kg bw/day	Source
Kresoxim-methyl	0.4	COM 2011	Propamocarb (sum)	0.29	COM 2007
Lindane	0.005	COM 2000	Propargite	0.01	JMPR 1991 EFSA: Data not sufficient to derive a MRL
Linuron	0.003	COM 2003	Propiconazole	0.04	COM 2003
Malathion (sum)	0.03	COM 2010	Propoxur	0.02	JMPR 1989
Mecoprop (sum)	0.01	COM 2003	Propyzamide	0.02	COM 2003
Mepiquat	0.2	COM 2008	Prothiofos		No information (COM 2002)
Metalaxyl (sum)	0.08	COM 2002	Pymetrozine	0.03	COM 2001
Methacrifos	0.006	JMPR 1990	Pyraclostrobin	0.03	COM 2004
Methamidophos	0.001	COM 2007	Pyrazophos	0.004	JMPR 1992
Methidathion	0.001	JMPR 1997	Pyridaben	0.01	EFSA 2010
Methiocarb (sum)	0.013	COM 2007	Pyridate (sum)	0.036	COM 2001
Methomyl and Thiodicarb	0.0025	COM 2009	Pyrimethanil	0.17	COM 2006
Metribuzin	0.013	COM 2007	Pyriproxyfen	0.1	COM 2008
Mevinphos	0.0008	JMPR 2000	Quinalphos		No information (COM 2002)
Monocrotophos	0.0006	JMPR 1995	Quinoxyfen	0.2	COM 2004
Myclobutanil	0.025	EFSA 2010	Quintozene (sum)	0.01	COM 2000
Ofurace		No information (COM 2002)	Quizalofop		No information (COM 2002)
Omethoate	0.0003	COM 2007	Spiroxamine	0.025	COM 1999
Orthophenylphenol	0.4	EFSA 2008	Tebuconazole	0.03	EFSA 2008
Oxamyl	0.001	COM 2006	Tebufenozide	0.02	COM 2010
Oxydemeton-methyl (sum)	0.0003	COM 2006	Tebufenpyrad	0.01	COM 2009
Parathion-methyl (sum)	0.003	JMPR 2003	Tecnazene	0.02	JMPR 1994
Penconazole	0.03	COM 2009	Tetrachlorvinphos		No information (COM 2002)
Pendimethalin	0.125	COM 2003	Tetraconazole	0.004	EFSA 2008
Pentachlorobenzene		No information	Tetradifon	0.015	DE 2001
Pentachlorophenol		No information	Thiabendazole	0.1	COM 2001
Permethrin (sum)	0.05	JMPR 2002	Thiophanate-methyl	0.08	COM 2005
Phenthoate	0.003	JMPR 1984	Tolclofos-methyl	0.064	COM 2006
Phorate (sum)	0.0007	JMPR 2005	Tolylfluanid (sum)	0.1	COM 2006
Phosalone	0.01	COM 2006	Triadimefon (sum)	0.05	JMPR 2004
Phosmet (sum)	0.003	COM 2007	Triallate	0.025	EFSA 2008
Pirimicarb (sum)	0.035	COM 2006	Triazophos	0.001	JMPR 2002
Pirimiphos-methyl	0.004	EFSA 05	Trichlorfon	0.045	DAR, ES EFSA: No agreed ADI available
Prochloraz (sum)	0.01	EFSA 2011	Trifloxystrobin	0.1	COM 2003
Procymidone	0.0028	DAR FR 2007	Triflumuron	0.014	COM 2011
Profenofos	0.03	JMPR 2007	Vinclozolin (sum)	0.005	COM 2006

7.6 Reduction factors.

Reductions factors for the pesticides have been found from the literature in citrus fruits, melons and bananas. Reduction factors in citrus fruits from Rapport 7/98 Statens Livsmedelverk, Sweden is shown below.

Reduction factors in citrus fruits found in Sweden:

Commodity/pesticide	Content of total residue in peel (%)
Orange	
Azinfosmethyl	≥90
Bromopropylat	≥90
Dicofol	97
Dimethoate	≥90
Fenithrothion	≥95
Phosmet	≥90
Chlorfenvinphos	≥90
Chlorpyrifos	≥90
Quinalphos	≥90
Mecarbam	≥95
Methidathion	≥95
Parathion	≥95
Parathion-methyl	≥95
Tetradifon	≥90
Lemon	
Mecarbam	≥95
Grapefruit	
Ethion	≥97
Small citrus fruits	
Ethion	≥95
Chlorfenvinphos	≥90
Malathion	≥97
Methidathion	≥95

Livsmedelverket has found that for thiabendazol about 15-25% of the pesticide is in the pulp from oranges.

The reduction factors found in the JMPR reports are shown below.

Reduction factors found in JMPR reports

Pesticide	Commodity	Reduction	Source
Thiabendazole	Oranges	<3% in pulp; >97% in peel	JMPR 2000
Imazalil	Melon	About 10% in pulp; about 90% in peel	JMPR 1994
Phenyl-phenol	Oranges	2-4% in pulp; 96-98 % in peel	JMPR 1999
Benomyl	Oranges	From oranges to orange juice the reduction is 17-98%	JMPR 1998
Procymidon	Kiwi	In pulp about 1%; in peel about 99%	JMPR 1998

Conclusion

Most results for reduction factors are for citrus fruits. As bananas and melons also have a thick peel it is estimated that the results for citrus fruits can be transferred to these two commodities. Therefore overall a reduction factor of 90% is used for, both citrus fruits, melons and bananas except for thiabendazole and pesticides from the benomyl group (carbendazim, thiophanat-methyl and benomyl). For these substances a reduction of 75% is used, as it is the lowest reduction found and the worst-case situation.

Processing factors used in present report:

Commodity	Processing factor
Bananas Grapefruit Lemons, lime Mandarins, clementines Melons Mineola Oranges Pomelos Watermelon	75% for,thiabendazole, thiophanate-methyl, carbendazim and benomyl 90% for all other pesticides

7.7 Exposure and sum of Hazard Quotients (Hazard Index (HI)) for individual commodities (consumer group “Adults”).

Model 1: No correction for non-detects
Model 3: Non-detects assumed to be ½LOR; correction factor limited to 25.
Corrected for peeling unless stated otherwise.

Commodity	**Exposure (µg/kg bw/day)**		**Exposure (µg/day)**		**Hazard Index**	
	Model 1	**Model 3**	**Model 1**	**Model 3**	**Model 1**	**Model 3**
Apples	0.27	0.57	20	43	1.3%	6.9%
Apricot, dried	0.000015	0.000025	0.0012	0.0019	0.0%	0.0001%
Apricots	0.000015	0.000028	0.0011	0.0021	0.0001%	0.0001%
Aspargus	0.000064	0.00018	0.0048	0.013	0.0006%	0.0013%
Aubergines	0.00078	0.0027	0.059	0.21	0.0025%	0.018%
Avocados	0.0014	0.0021	0.1	0.16	0.011%	0.017%
Bananas	0.012	0.016	0.92	1.2	0.031%	0.049%
Bananas (not peeled)	*0.087*	*0.11*	*6.5*	*8.6*	*0.27%*	*0.44%*
Barley grit	0.0000097	0.000018	0.00073	0.0013	0.0%	0.0%
Barley kernels	0.000021	0.000029	0.0016	0.0022	0.0%	0.0%
Beans with pods	0.0013	0.0052	0.1	0.39	0.025%	0.12%
Beans, dried	0.0000081	0.000031	0.00061	0.0023	0.0001%	0.0005%
Berries, dried	0.000062	0.000083	0.0046	0.0062	0.0005%	0.0009%
Berries, others	0.0000024	0.0000091	0.00018	0.00068	0.0%	0.0001%
Blueberries	0.0000052	0.000011	0.00039	0.00084	0.0%	0.0%
Broccoli	0.00003	0.00033	0.0022	0.025	0.0002%	0.0019%
Brussels sprouts	0.000079	0.00023	0.006	0.017	0.0005%	0.0017%
Carrots	0.0055	0.037	0.41	2.7	0.15%	1.0%
Cauliflower	0.000012	0.00016	0.00093	0.012	0.0004%	0.0057%
Celeriac	0.00014	0.00033	0.01	0.025	0.0034%	0.0072%
Celery	0.0015	0.0021	0.11	0.16	0.01%	0.016%
Cherries	0.000028	0.000057	0.0021	0.0043	0.001%	0.0042%
Chervil	0.000018	0.00002	0.0013	0.0015	0.0002%	0.0002%
Chick pea	0.00029	0.00031	0.022	0.023	0.0001%	0.0001%
Chilli peppers	0.000065	0.0001	0.0049	0.0078	0.0017%	0.0031%
Chives	0.000028	0.00004	0.0021	0.003	0.0001%	0.0002%
Coriander, leaves	0.000034	0.000035	0.0025	0.0026	0.0003%	0.0003%
Corn, dried	0.00028	0.00038	0.021	0.029	0.004%	0.0064%
Cornflour	0.000065	0.000088	0.0049	0.0066	0.0005%	0.0007%
Courgettes	0.00034	0.0022	0.025	0.16	0.011%	0.03%
Cucumbers	0.024	0.053	1.8	4	0.16%	0.69%
Currants	0.00004	0.000052	0.003	0.0039	0.0001%	0.0002%
Dill	0.000044	0.000045	0.0033	0.0034	0.0004%	0.0005%
Fennel	0.0000015	0.0000022	0.00011	0.00016	0.0%	0.0%
Figs, fresh	0.000049	0.00006	0.0037	0.0045	0.0003%	0.0004%
Fruit (other), dried	0.00000027	0.0000023	0.00002	0.00018	0.0%	0.0%
Fruit, exotic	0.000021	0.000052	0.0015	0.0039	0.0001%	0.0009%
Fruit, mixed	0.0000026	0.0000049	0.0002	0.00037	0.0%	0.0%
Garlics	0.00000026	0.0000036	0.00002	0.00027	0.0%	0.0%
Gherkin	0.0028	0.0035	0.21	0.26	0.0056%	0.0071%
Gooseberries	0.0000069	0.0000096	0.00052	0.00072	0.0%	0.0%
Grapefruit	0.0046	0.0051	0.35	0.38	0.016%	0.034%
Grapefruit (not peeled)	*0.032*	*0.037*	*2.4*	*2.7*	*0.14%*	*0.33%*
Head cabbage	0.000023	0.00036	0.0017	0.027	0.0002%	0.0051%
Head cabbage, red	0.000017	0.000063	0.0013	0.0048	0.0%	0.0001%
Herbs	0.000014	0.000036	0.001	0.0027	0.0001%	0.0007%
Kale	0.00081	0.00087	0.061	0.065	0.0011%	0.0013%

Commodity	Exposure (µg/kg bw/day)		Exposure (µg/day)		Hazard Index	
	Model 1	**Model 3**	**Model 1**	**Model 3**	**Model 1**	**Model 3**
Kiwi	0.039	0.044	2.9	3.3	0.12%	0.27%
Leek	0.0023	0.0034	0.17	0.25	0.0051%	0.0079%
Lemons, lime	0.0014	0.0016	0.11	0.12	0.0071%	0.012%
Lemons, lime (not peeled)	*0.012*	*0.014*	*0.93*	*1.1*	*0.069%*	*0.12%*
Lentils	0.00021	0.00022	0.016	0.016	0.0001%	0.0001%
Lettuce	0.052	0.063	3.9	4.8	0.18%	0.26%
Lettuce, iceberg	0.00000038	0.0000019	0.000029	0.00014	0.0%	0.0%
Mandarins, clementines	0.026	0.029	2	2.2	0.11%	0.21%
Mandarins, clementines (not peeled)	*0.21*	*0.24*	*16*	*18*	*1.1%*	*2.0%*
Mango	0.002	0.0025	0.15	0.19	0.012%	0.014%
Marmelade, orange	0.0000046	0.000014	0.00035	0.0011	0.0%	0.0002%
Melons	0.0015	0.0051	0.11	0.38	0.011%	0.08%
Melons (not peeled)	*0.014*	*0.046*	*1*	*3.4*	*0.1%*	*0.79%*
Mineola	0.000069	0.00007	0.0052	0.0052	0.0001%	0.0001%
Mushroom	0.0022	0.0033	0.17	0.25	0.013%	0.022%
Nectarines	0.011	0.03	0.84	2.3	0.039%	0.3%
Oat kernels	0.000056	0.000059	0.0042	0.0044	0.0001%	0.0001%
Okra (Lady's fingers)	0.000027	0.000038	0.0021	0.0029	0.0002%	0.0002%
Onions	0.00018	0.0019	0.014	0.14	0.0015%	0.016%
Oranges	0.025	0.03	1.9	2.2	0.098%	0.28%
Oranges (not peeled)	*0.2*	*0.24*	*15*	*18*	*0.92%*	*2.7%*
Oranges, juice	0.001	0.016	0.078	1.2	0.0038%	0.068%
Papayas	0.00043	0.00051	0.032	0.038	0.0015%	0.0026%
Parsley	0.0001	0.00011	0.0076	0.008	0.0033%	0.0034%
Parsley Root	0.000035	0.0001	0.0026	0.0076	0.0007%	0.0019%
Parsnips	0.000047	0.00023	0.0035	0.017	0.0007%	0.0035%
Pasta	0.00034	0.0025	0.025	0.19	0.0068%	0.05%
Peaches	0.013	0.032	0.95	2.4	0.055%	0.28%
Pear, canned	0.000086	0.00012	0.0065	0.0088	0.0002%	0.0002%
Pears	0.073	0.14	5.5	11	0.29%	1.0%
Peas with pods	0.00014	0.00019	0.01	0.015	0.0022%	0.0034%
Peas without pods	0.0024	0.0084	0.18	0.63	0.04%	0.24%
Peppers, sweet	0.0056	0.033	0.42	2.5	0.067%	0.31%
Persimmon	0.000056	0.00034	0.0042	0.026	0.0007%	0.0038%
Pineapples	0.015	0.02	1.1	1.5	0.052%	0.24%
Plums	0.0088	0.017	0.66	1.3	0.024%	0.12%
Pomegranate	0.000013	0.000024	0.001	0.0018	0.0001%	0.0001%
Pomelos	0.000028	0.000031	0.0021	0.0023	0.0001%	0.0002%
Pomelos (not peeled)	*0.00018*	*0.0002*	*0.013*	*0.015*	*0.0007%*	*0.0015%*
Potatoes	0.033	0.055	2.5	4.1	0.071%	0.17%
Radish	0.0000036	0.000006	0.00027	0.00045	0.0%	0.0%
Raisin	0.00025	0.00032	0.019	0.024	0.0012%	0.0016%
Raspberries, blackberries	0.0017	0.004	0.13	0.3	0.008%	0.02%
Rhubarbs	0.000015	0.000034	0.0012	0.0025	0.0%	0.0001%
Rice	0.00073	0.005	0.055	0.38	0.0089%	0.067%
Rice, short grained	0.0000092	0.000046	0.00069	0.0034	0.0002%	0.0011%
Rolled oat	0.0077	0.016	0.58	1.2	0.02%	0.056%
Ruccola	0.00017	0.00017	0.013	0.013	0.0003%	0.0003%
Rye flour	0.016	0.032	1.2	2.4	0.24%	0.44%
Sesame seed	0.0000065	0.000014	0.00049	0.0011	0.0002%	0.0004%
Spinach	0.00062	0.0023	0.046	0.17	0.0069%	0.026%
Spring onions	0.0000089	0.000019	0.00067	0.0014	0.0002%	0.0005%
Strawberries	0.01	0.023	0.76	1.8	0.033%	0.11%
Sweet corn (small)	0.00000017	0.0000013	0.000013	0.000097	0.0%	0.0%
Table grapes	0.056	0.11	4.2	8.4	0.21%	0.74%

Commodity	Exposure (μg/kg bw/day)		Exposure (μg/day)		Hazard Index	
	Model 1	**Model 3**	**Model 1**	**Model 3**	**Model 1**	**Model 3**
Teas	0.0021	0.0047	0.15	0.35	0.051%	0.12%
Tomatoes	0.045	0.15	3.4	11	0.29%	1.2%
Vegetables, unspecified	0.000026	0.00003	0.002	0.0022	0.0016%	0.0018%
Watermelon	0.00014	0.0006	0.01	0.045	0.0027%	0.0078%
Watermelon (not peeled)	*0.0011*	*0.0051*	*0.086*	*0.38*	*0.027%*	*0.076%*
Wheat bran	0.00073	0.00076	0.055	0.057	0.0026%	0.0029%
Wheat flour	0.061	0.22	4.6	16	0.3%	1.3%
Wine, red	0.037	0.11	2.8	8.4	0.13%	0.48%
Wine, white	0.02	0.022	1.5	1.6	0.045%	0.05%
Total	**0.90**	**1.94**	**68**	**146**	**4%**	**18%**

7.8 Exposure and sum of Hazard Quotients (Hazard Index (HI)) for individual pesticides (consumer group "Children").

Model 1: No correction for non-detects
Model 3: Non-detects assumed to be ½LOR; correction factor limited to 25.
Corrected for peeling unless stated otherwise.

Commodity	Exposure (µg/kg bw/day)		Exposure (µg/day)		Hazard Index	
	Model 1	Model 3	Model 1	Model 3	Model 1	Model 3
Apples	0.72	1.5	16	33	3.6%	18.0%
Apricot, dried	0.000062	0.0001	0.0013	0.0022	0.00012%	0.0002%
Apricots						
Aspargus	0.000023	0.000062	0.00049	0.0013	0.00022%	0.00044%
Aubergines	0.0002	0.00069	0.0043	0.015	0.00062%	0.0045%
Avocados	0.00075	0.0011	0.016	0.025	0.0063%	0.0093%
Bananas	0.034	0.043	0.75	0.95	0.086%	0.14%
Bananas (not peeled)	*0.24*	*0.32*	*5.3*	*7*	*0.76%*	*1.2%*
Barley grit	0.000033	0.00006	0.00073	0.0013	0.000011%	0.00002%
Barley kernels	0.000072	0.0001	0.0016	0.0022	0.000024%	0.000034%
Beans with pods	0.0023	0.0093	0.051	0.2	0.045%	0.21%
Beans, dried	0.000019	0.000073	0.00042	0.0016	0.00032%	0.0012%
Berries, dried	0.00021	0.00029	0.0046	0.0062	0.0017%	0.0032%
Berries, others	0.0000084	0.000031	0.00018	0.00068	0.000067%	0.00026%
Blueberries						
Broccoli	0.00004	0.00044	0.00088	0.0096	0.00024%	0.0026%
Brussels sprouts	0.00011	0.00031	0.0024	0.0067	0.00063%	0.0023%
Carrots	0.016	0.11	0.35	2.4	0.46%	3.0%
Cauliflower	0.00001	0.00013	0.00022	0.0028	0.00036%	0.0047%
Celeriac	0.00033	0.00081	0.0073	0.018	0.0083%	0.018%
Celery	0.00079	0.0011	0.017	0.025	0.0056%	0.0087%
Cherries	0.000067	0.00014	0.0015	0.003	0.0023%	0.01%
Chervil	0.000061	0.00007	0.0013	0.0015	0.00057%	0.00062%
Chick pea						
Chilli peppers	0.00022	0.00036	0.0049	0.0078	0.0059%	0.011%
Chives	0.000022	0.000032	0.00049	0.0007	0.00011%	0.00018%
Coriander, leaves						
Corn, dried	0.0023	0.0031	0.049	0.068	0.032%	0.052%
Cornflour	0.00043	0.00058	0.0094	0.013	0.0035%	0.0048%
Courgettes	0.000082	0.00053	0.0018	0.012	0.0027%	0.0072%
Cucumbers	0.15	0.32	3.2	7	0.96%	4.2%
Currants						
Dill	0.000019	0.00002	0.00042	0.00043	0.00019%	0.0002%
Fennel	0.0000051	0.0000074	0.00011	0.00016	0.000034%	0.000047%
Figs, fresh	0.00017	0.00021	0.0037	0.0045	0.00086%	0.0012%
Fruit (other), dried	0.00000092	0.000008	0.00002	0.00018	0.000005%	0.00004%
Fruit, exotic	0.000071	0.00018	0.0015	0.0039	0.00043%	0.0031%
Fruit, mixed	0.0000091	0.000017	0.0002	0.00037	0.000035%	0.000067%
Garlics	0.00000006	0.00000081	0.0000013	0.000018	0.0000004%	0.000005%
Gherkin	0.0039	0.0049	0.086	0.11	0.0079%	0.0098%
Gooseberries						
Grapefruit	0.0062	0.0068	0.14	0.15	0.021%	0.046%
Grapefruit (not peeled)	*0.043*	*0.049*	*0.94*	*1.1*	*0.19%*	*0.44%*
Head cabbage	0.000026	0.00042	0.00058	0.0091	0.00025%	0.0059%
Head cabbage, red	0.000021	0.000078	0.00047	0.0017	0.000036%	0.00013%
Herbs	0.000047	0.00012	0.001	0.0027	0.00046%	0.0025%
Kale	0.0014	0.0015	0.031	0.033	0.002%	0.0023%

Commodity	Exposure (µg/kg bw/day)		Exposure (µg/day)		Hazard Index	
	Model 1	Model 3	Model 1	Model 3	Model 1	Model 3
Kiwi	0.12	0.13	2.6	2.9	0.38%	0.82%
Leek	0.0027	0.004	0.059	0.087	0.006%	0.0094%
Lemons, lime	0.0022	0.0025	0.049	0.055	0.011%	0.019%
Lemons, lime (not peeled)	*0.02*	*0.022*	*0.43*	*0.49*	*0.11%*	*0.18%*
Lentils	0.00072	0.00075	0.016	0.016	0.00025%	0.00027%
Lettuce	0.038	0.046	0.83	1	0.13%	0.19%
Lettuce, iceberg	0.0000085	0.000043	0.00018	0.00093	0.00016%	0.00083%
Mandarins, clementines	0.035	0.04	0.77	0.86	0.15%	0.28%
Mandarins, clementines (not peeled)	*0.29*	*0.33*	*6.3*	*7.2*	*1.5%*	*2.7%*
Mango	0.0024	0.003	0.052	0.064	0.014%	0.016%
Marmelade, orange	0.000016	0.000049	0.00035	0.0011	0.00011%	0.00063%
Melons	0.0083	0.029	0.18	0.62	0.06%	0.45%
Melons (not peeled)	*0.076*	*0.26*	*1.7*	*5.6*	*0.58%*	*4.4%*
Mineola	0.00024	0.00024	0.0052	0.0052	0.00038%	0.00038%
Mushroom	0.0024	0.0035	0.052	0.077	0.014%	0.023%
Nectarines	0.032	0.086	0.69	1.9	0.11%	0.84%
Oat kernels	0.00019	0.0002	0.0042	0.0044	0.00043%	0.00044%
Okra (Lady's fingers)	0.000094	0.00013	0.0021	0.0029	0.00058%	0.00084%
Onions	0.00026	0.0027	0.0057	0.059	0.0021%	0.022%
Oranges	0.034	0.04	0.74	0.87	0.13%	0.37%
Oranges (not peeled)	*0.27*	*0.33*	*6*	*7.2*	*1.2%*	*3.6%*
Oranges, juice	0.0029	0.045	0.062	0.98	0.011%	0.19%
Papayas	0.00051	0.00061	0.011	0.013	0.0018%	0.0032%
Parsley	0.000075	0.000079	0.0016	0.0017	0.0024%	0.0025%
Parsley Root	0.000025	0.000072	0.00054	0.0016	0.00051%	0.0013%
Parsnips	0.000034	0.00017	0.00074	0.0036	0.00052%	0.0025%
Pasta	0.0013	0.0094	0.028	0.2	0.026%	0.19%
Peaches	0.035	0.089	0.77	1.9	0.15%	0.79%
Pear, canned	0.00016	0.00022	0.0034	0.0047	0.00039%	0.00042%
Pears	0.17	0.33	3.7	7.3	0.68%	2.5%
Peas with pods	0.002	0.0028	0.043	0.061	0.032%	0.049%
Peas without pods	0.0027	0.0095	0.059	0.21	0.045%	0.27%
Peppers, sweet	0.014	0.082	0.3	1.8	0.17%	0.76%
Persimmon	0.000067	0.00041	0.0015	0.0089	0.00083%	0.0045%
Pineapples	0.023	0.031	0.51	0.69	0.082%	0.38%
Plums	0.019	0.036	0.41	0.79	0.05%	0.26%
Pomegranate	0.000046	0.000082	0.001	0.0018	0.0002%	0.00041%
Pomelos	0.000097	0.00011	0.0021	0.0023	0.00027%	0.00054%
Pomelos (not peeled)	*0.00062*	*0.0007*	*0.013*	*1.5%*	*0.0023%*	*0.00005*
Potatoes	0.059	0.098	1.3	2.1	0.13%	0.31%
Radish	0.000013	0.000021	0.00027	0.00045	0.000059%	0.000092%
Raisin	0.0012	0.0015	0.026	0.033	0.0059%	0.0076%
Raspberries, blackberries	0.0034	0.0079	0.073	0.17	0.016%	0.04%
Rhubarbs	0.000036	0.000079	0.00078	0.0017	0.00011%	0.00023%
Rice	0.0014	0.01	0.032	0.22	0.018%	0.13%
Rice, short grained	0.00011	0.00055	0.0024	0.012	0.0028%	0.014%
Rolled oat	0.024	0.049	0.53	1.1	0.062%	0.17%
Ruccola	0.00058	0.00059	0.013	0.013	0.00099%	0.0012%
Rye flour	0.049	0.098	1.1	2.1	0.76%	1.4%
Sesame seed	0.0000079	0.000017	0.00017	0.00037	0.00021%	0.00045%
Spinach	0.0012	0.0045	0.027	0.098	0.014%	0.052%
Spring onions	0.000031	0.000064	0.00067	0.0014	0.00083%	0.0019%
Strawberries	0.019	0.045	0.42	0.99	0.063%	0.2%
Sweet corn (small)	0.00000058	0.0000044	0.000013	0.000097	0.00001%	0.000095%
Table grapes	0.12	0.24	2.6	5.2	0.44%	1.6%

Commodity	Exposure (µg/kg bw/day)		Exposure (µg/day)		Hazard Index	
	Model 1	**Model 3**	**Model 1**	**Model 3**	**Model 1**	**Model 3**
Teas	0.00023	0.00053	0.0051	0.012	0.0058%	0.013%
Tomatoes	0.084	0.27	1.8	6	0.55%	2.3%
Vegetables, unspecified	0.00009	0.0001	0.002	0.0022	0.0055%	0.0061%
Watermelon	0.00077	0.0033	0.017	0.072	0.015%	0.043%
Watermelon (not peeled)	*0.0064*	*0.029*	*0.14*	*0.62*	*0.15%*	*0.42%*
Wheat bran	0.002	0.0021	0.044	0.045	0.0072%	0.008%
Wheat flour	0.17	0.6	3.7	13	0.82%	3.5%
Wine, red						
Wine, white						
Total	2.0	4.5	44	98	10%	44%

7.9 Exposure and Hazard Quotients for individual pesticides (consumer group "Adults").

Model 1: No correction for non-detects
Model 3: Non-detects assumed to be ½LOR; correction factor limited to 25.
Corrected for peeling.

Pesticide	Exposure (µg/kg bw/day)		Exposure (µg/day)		Hazard Quotient	
	Model 1	Model 3	Model 1	Model 3	Model 1	Model 3
2,4-D (sum)	0.00035	0.0023	0.026	0.17	0.0007%	0.0046%
Acephate	0.000091	0.0012	0.0068	0.088	0.0003%	0.0039%
Acetamiprid	0.0017	0.011	0.13	0.81	0.0024%	0.015%
Aclonifen	0.00001	0.00003	0.00077	0.0022	0.00002%	0.00004%
Aldicarb (sum)	0.000053	0.0013	0.004	0.097	0.0018%	0.043%
Aldrin and Dieldrin	0.000009	0.00023	0.00068	0.017	0.009%	0.23%
Atrazine	0.0000016	0.000041	0.00012	0.0031	0.00001%	0.0002%
Azinphos-methyl	0.0058	0.022	0.43	1.7	0.12%	0.44%
Azoxystrobin	0.013	0.021	0.99	1.6	0.0066%	0.011%
Benalaxyl (sum)	0.000035	0.00014	0.0026	0.011	0.00009%	0.00036%
Benfuracarb	0.00014	0.0017	0.011	0.13	0.0014%	0.017%
Bifenthrin	0.0014	0.0064	0.1	0.48	0.0092%	0.043%
Binapacryl	0.00000087	0.000022	0.000065	0.0016		
Biphenyl	0.000044	0.0011	0.0033	0.083	0.00004%	0.00089%
Bitertanol	0.0058	0.009	0.43	0.67	0.19%	0.3%
Bromopropylate	0.0022	0.011	0.17	0.84	0.0075%	0.037%
Bupirimate	0.00051	0.012	0.038	0.9	0.001%	0.024%
Buprofezin	0.00014	0.0022	0.011	0.17	0.0014%	0.022%
Captafol	0.0000011	0.000027	0.000081	0.002		
Captan/Folpet (sum)	0.0047	0.053	0.35	4	0.0047%	0.053%
Carbaryl	0.017	0.043	1.3	3.2	0.23%	0.57%
Carbendazim and benomyl	0.052	0.087	3.9	6.5	0.26%	0.43%
Carbofuran (sum)	0.00001	0.00017	0.00076	0.013	0.0067%	0.11%
Carbosulfan	0.00021	0.0048	0.016	0.36	0.0042%	0.097%
Chlorfenvinphos	0.00026	0.0028	0.019	0.21	0.051%	0.57%
Chlormequat	0.066	0.076	5	5.7	0.17%	0.19%
Chlorothalonil	0.0058	0.012	0.44	0.92	0.039%	0.082%
Chlorpropham	0.031	0.031	2.3	2.4	0.062%	0.063%
Chlorpropham (sum)	0.00026	0.0051	0.02	0.38	0.00052%	0.01%
Chlorpyrifos	0.014	0.023	1.1	1.8	0.14%	0.23%
Chlorpyrifos-methyl	0.0013	0.02	0.095	1.5	0.013%	0.2%
Chlorthal-dimethyl	0.000012	0.00031	0.00092	0.023	0.00012%	0.0031%
Clofentezine	0.00028	0.00096	0.021	0.072	0.0014%	0.0048%
Cyfluthrin (sum)	0.00012	0.0029	0.0093	0.21	0.0041%	0.095%
Cyhalothrin, lambda-	0.0011	0.0087	0.081	0.65	0.022%	0.17%
Cypermethrin (sum)	0.0022	0.01	0.17	0.78	0.0045%	0.021%
Cyprodinil	0.014	0.019	1	1.4	0.045%	0.062%
Cyromazine	0.0016	0.0084	0.12	0.63	0.0027%	0.014%
DDT (sum)	0.000068	0.0017	0.0051	0.13	0.00068%	0.017%
Deltamethrin	0.0013	0.0091	0.095	0.68	0.013%	0.091%
Diazinon	0.0002	0.0047	0.015	0.35	0.1%	2.4%
Dichlofluanid	0.00012	0.0018	0.0094	0.14	0.00004%	0.00061%
Dichlorprop	0.0000057	0.00014	0.00043	0.011	0.00001%	0.00024%
Dichlorvos	0.0000038	0.000096	0.00029	0.0072	0.0048%	0.12%
Dicloran	0.00086	0.0027	0.065	0.21	0.017%	0.055%
Dicofol (sum)	0.0025	0.017	0.19	1.3	0.12%	0.86%
Diethofencarb	0.00026	0.0035	0.02	0.27	0.00006%	0.00082%
Difenoconazole	0.0011	0.0066	0.081	0.5	0.011%	0.066%

Pesticide	Exposure (µg/kg bw/day)		Exposure (µg/day)		Hazard Quotient	
	Model 1	Model 3	Model 1	Model 3	Model 1	Model 3
Diflufenican	0.000055	0.0012	0.0042	0.092	0.00003%	0.00061%
Dimethoate	0.00049	0.0063	0.037	0.48	0.049%	0.63%
Dimethomorph	0.0064	0.014	0.48	1.1	0.013%	0.028%
Diniconazole	0.000051	0.0009	0.0038	0.068	0.00025%	0.0045%
Diphenylamine	0.061	0.065	4.6	4.9	0.081%	0.086%
Dithiocarbamates	0.098	0.21	7.4	16	0.2%	0.42%
Endosulfan (sum)	0.0027	0.0085	0.21	0.63	0.046%	0.14%
Epoxiconazole	0.000014	0.000077	0.0011	0.0058	0.00018%	0.00097%
Ethion	0.000067	0.00083	0.005	0.062	0.0034%	0.041%
Ethoxyquin	0.00023	0.0057	0.017	0.43	0.0046%	0.11%
Famoxadone	0.00063	0.0031	0.047	0.23	0.0052%	0.026%
Fenarimol	0.00012	0.0021	0.0089	0.16	0.0012%	0.021%
Fenazaquin	0.00043	0.0045	0.032	0.34	0.0085%	0.091%
Fenbuconazole	0.000025	0.00036	0.0018	0.027	0.00041%	0.0059%
Fenhexamid	0.061	0.072	4.6	5.4	0.031%	0.036%
Fenitrothion	0.00059	0.0054	0.044	0.41	0.012%	0.11%
Fenoxaprop-P-Ethyl	0.0000031	0.000077	0.00023	0.0058	0.00003%	0.00077%
Fenpropathrin	0.000041	0.001	0.003	0.076	0.00014%	0.0034%
Fenpropimorph	0.000063	0.0011	0.0048	0.08	0.0021%	0.035%
Fenson	0.00000002	0.0000006	0.0000018	0.000045		
Fenthion (sum)	0.00019	0.00074	0.014	0.055	0.0027%	0.011%
Fenvalerat, esfenvalerat, RR- and SS-	0.00033	0.0044	0.025	0.33	0.0017%	0.022%
Fenvalerat, esfenvalerat, RS- and SR-	0.00015	0.0007	0.012	0.053	0.00077%	0.0035%
Flucythrinate	0.00001	0.00026	0.00078	0.019	0.00005%	0.0013%
Fludioxonil	0.0086	0.025	0.64	1.9	0.0023%	0.0069%
Fluoxastrobin	0.000002	0.000051	0.00015	0.0038	0.00001%	0.00034%
Fluroxypyr (sum)	0.00005	0.0013	0.0038	0.094	0.00001%	0.00016%
Flusilazole	0.000016	0.00039	0.0012	0.029	0.00079%	0.02%
Flutriafol	0.00083	0.001	0.063	0.078	0.0083%	0.01%
Fluvalinate, tau-	0.00036	0.0038	0.027	0.28	0.0072%	0.076%
Glyphosate	0.013	0.11	0.95	8.4	0.0042%	0.037%
HCH (sum)	0.000014	0.00035	0.0011	0.026		
Hexachlorobenzene	0.000017	0.00032	0.0013	0.024		
Hexaconazole	0.00011	0.00037	0.0086	0.028	0.0023%	0.0075%
Hexythiazox	0.00015	0.0022	0.011	0.17	0.00049%	0.0074%
Imazalil	0.042	0.072	3.2	5.4	0.17%	0.29%
Iprodione	0.056	0.099	4.2	7.4	0.093%	0.16%
Iprovalicarb	0.0018	0.0086	0.14	0.64	0.012%	0.057%
Kresoxim-methyl	0.00043	0.0029	0.032	0.21	0.00011%	0.00071%
Lindane	0.00000003	0.00000066	0.000002	0.000049	0.0%	0.00001%
Linuron	0.0026	0.01	0.2	0.76	0.087%	0.34%
Malathion (sum)	0.0037	0.019	0.28	1.4	0.012%	0.064%
Mecoprop (sum)	0.000034	0.00085	0.0025	0.064	0.00034%	0.0085%
Mepiquat	0.00077	0.0054	0.058	0.41	0.00039%	0.0027%
Metalaxyl (sum)	0.0026	0.012	0.2	0.91	0.0033%	0.015%
Methacrifos	0.0000013	0.000032	0.000095	0.0024	0.00002%	0.00053%
Methamidophos	0.00091	0.0029	0.068	0.22	0.091%	0.29%
Methidathion	0.00025	0.00097	0.019	0.072	0.025%	0.097%
Methiocarb (sum)	0.00035	0.0016	0.026	0.12	0.0027%	0.012%
Methomyl and Thiodicarb	0.0026	0.0083	0.19	0.62	0.1%	0.33%
Metribuzin	0.00023	0.005	0.018	0.37	0.0018%	0.038%
Mevinphos	0.000044	0.00019	0.0033	0.014	0.0055%	0.023%
Monocrotophos	0.0000013	0.0000052	0.000095	0.00039	0.00021%	0.00087%
Myclobutanil	0.0013	0.006	0.097	0.45	0.0052%	0.024%
Ofurace	0.000095	0.0024	0.0071	0.18		

Pesticide	Exposure (μg/kg bw/day)		Exposure (μg/day)		Hazard Quotient	
	Model 1	Model 3	Model 1	Model 3	Model 1	Model 3
Omethoate	0.00022	0.0039	0.017	0.29	0.074%	1.3%
Orthophenylphenol	0.0051	0.011	0.39	0.84	0.0013%	0.0028%
Oxamyl	0.0003	0.0026	0.022	0.19	0.03%	0.26%
Oxydemeton-methyl (sum)	0.000029	0.00074	0.0022	0.055	0.0098%	0.25%
Parathion-methyl (sum)	0.000068	0.0016	0.0051	0.12	0.0023%	0.053%
Penconazole	0.00028	0.0019	0.021	0.14	0.00092%	0.0064%
Pendimethalin	0.000088	0.0011	0.0066	0.082	0.00007%	0.00088%
Pentachlorobenzene	0.000006	0.00015	0.00045	0.011		
Pentachlorophenol	0.00000005	0.0000013	0.000004	0.0001		
Permethrin (sum)	0.0004	0.0017	0.03	0.12	0.0008%	0.0033%
Phenthoate	0.000021	0.000086	0.0016	0.0065	0.0007%	0.0029%
Phorate (sum)	0.0000065	0.00016	0.00049	0.012	0.00093%	0.023%
Phosalone	0.0066	0.019	0.5	1.4	0.066%	0.19%
Phosmet (sum)	0.00095	0.021	0.072	1.6	0.032%	0.69%
Pirimicarb (sum)	0.002	0.0082	0.15	0.61	0.0056%	0.023%
Pirimiphos-methyl	0.016	0.043	1.2	3.2	0.4%	1.1%
Prochloraz (sum)	0.0045	0.0064	0.34	0.48	0.045%	0.064%
Procymidone	0.0076	0.018	0.57	1.3	0.27%	0.64%
Profenofos	0.000056	0.00046	0.0042	0.034	0.00019%	0.0015%
Propamocarb (sum)	0.026	0.032	2	2.4	0.0091%	0.011%
Propargite	0.021	0.061	1.6	4.6	0.21%	0.61%
Propiconazole	0.000023	0.00035	0.0017	0.026	0.00006%	0.00087%
Propoxur	0.00000002	0.00000039	0.0000012	0.000029	0.0%	0.0%
Propyzamide	0.0003	0.0006	0.022	0.045	0.0015%	0.003%
Prothiofos	0.0000082	0.00015	0.00062	0.011		
Pymetrozine	0.003	0.0057	0.22	0.42	0.01%	0.019%
Pyraclostrobin	0.014	0.023	1	1.7	0.045%	0.076%
Pyrazophos	0.00004	0.001	0.003	0.075	0.001%	0.025%
Pyridaben	0.00042	0.0027	0.032	0.2	0.0042%	0.027%
Pyridate (sum)	0.0000025	0.000056	0.00019	0.0042	0.00001%	0.00015%
Pyrimethanil	0.013	0.043	1	3.2	0.0079%	0.025%
Pyriproxyfen	0.0011	0.003	0.085	0.22	0.0011%	0.003%
Quinalphos	0.000012	0.00029	0.00088	0.022		
Quinoxyfen	0.0000033	0.000037	0.00025	0.0028	0.0%	0.00002%
Quintozene (sum)	0.00026	0.0061	0.02	0.46	0.0026%	0.061%
Quizalofop	0.000057	0.00086	0.0043	0.064		
Spiroxamine	0.00057	0.0014	0.043	0.1	0.0023%	0.0056%
Tebuconazole	0.004	0.013	0.3	0.95	0.013%	0.042%
Tebufenozide	0.0017	0.01	0.13	0.75	0.0086%	0.05%
Tebufenpyrad	0.0014	0.0064	0.1	0.48	0.014%	0.064%
Tecnazene	0.0000039	0.000095	0.00029	0.0071	0.00002%	0.00048%
Tetrachlorvinphos	0.00000038	0.0000095	0.000028	0.00071		
Tetraconazole	0.000043	0.00037	0.0032	0.028	0.0011%	0.0092%
Tetradifon	0.000016	0.00038	0.0012	0.029	0.0001%	0.0026%
Thiabendazole	0.1	0.11	7.5	8.5	0.1%	0.11%
Thiophanate-methyl	0.017	0.031	1.3	2.4	0.022%	0.039%
Tolclofos-methyl	0.00059	0.0018	0.044	0.13	0.00093%	0.0028%
Tolylfluanid (sum)	0.0085	0.019	0.64	1.4	0.0085%	0.019%
Triadimefon (sum)	0.015	0.028	1.1	2.1	0.029%	0.055%
Triallate	0.0000032	0.00008	0.00024	0.006	0.00001%	0.00032%
Triazophos	0.0000036	0.000082	0.00027	0.0062	0.00036%	0.0082%
Trichlorfon	0.000031	0.00065	0.0023	0.049	0.00007%	0.0014%
Trifloxystrobin	0.0019	0.0095	0.14	0.72	0.0019%	0.0095%
Triflumuron	0.0024	0.007	0.18	0.52	0.017%	0.05%
Vinclozolin (sum)	0.0065	0.009	0.49	0.68	0.13%	0.18%
Hazard Index	0.90	1.94	68	146	4%	18%

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